THE ORCHESTRA

AND HOW TO LISTEN TO IT

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THE ORCHESTRA

AND

HOW TO LISTEN TO IT.

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BY

M. MONTAGU-NATHAN

Author of *A History of Russian Music,*
An Introduction to Russian Music, Glinka, Moussorgsky,
Rimsky-Korsakof, The Piano Music of Skryabin,
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LONDON:
KEGAN PAUL, TRENCH, TRUBNER & CO., LTD.
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PREFACE

It has often been observed that in addressing the general public on musical subjects, the writer and the lecturer are always at a disadvantage. Confronted even with that strange community—consisting partly of genuine lovers of the art and partly of folk who merely flirt with it—customarily described as the "musical public," one is justified in feeling uncertain as to the precise nature of the information this public requires or expects. For, were a census taken of the degrees of musical understanding and experience to be found in the individuals forming an average audience of music-lovers, it would surely be discovered that one could as easily catalogue such individuals according to the measure of musicality evinced by each as by their thumb-prints.

That this diversity is by no means confined to the musical public is shown by the variance of opinion among the critics of music themselves. When it is possible for one reviewer to estimate a volume on a musical subject as being "biographical rather than critical" and for a second to express the view that the self-same book is "critical rather than biographical," is it surprising that one section of an audience attending a lecture on Music should consider the discourse "too technical" and another "not sufficiently technical?"

Fortunately, with such a book as that to which these lines serve as Preface, these quandaries do not arise. It is written with full knowledge as to the kind of public addressed. The generic style of the Series for which it has been written does not, as has been hinted, definitely describe a particular and recognisable community or section of the public; but the title of the book itself does presuppose something, namely, that its reader does not understand the orchestra, nor does he understand how to listen to it, but that he is anxious to acquire the requisite knowledge.

It is recounted of the dramatist Wilde that after a series of unsatisfactory encounters with the theatrical public he found himself obliged on a certain occasion to respond to cries of "Author!", and that he addressed an enthusiastic audience with the words: "Ladies and gentlemen, you have succeeded."

If the present book should, unhappily, fail in its object, it will be no fault of the reader's, since the nature of its mission is so plainly evident that no one is likely to read it by mistake. It has been in this case the domain of the author to "succeed," and he fervently hopes that he has done so.

The musical quotations comprising Appendix I. are intended as illustrations of passages typical of the instruments for which they are written. They are selected for the most part from works frequently performed, and are furnished as a means of identification. They have been culled, as far as possible, from a small number of works which the reader may expect to hear fairly often. They are not to be regarded as being illustrative of the text of the book itself, but rather as something similar to the material of the Appendix to the novel in the body of which Mark Twain deliberately eschewed every allusion to the weather, electing to reserve such passages as "it rained forty days and forty nights," for the use and enjoyment of those who might be likely to insist on their presence somewhere in the volume. The instrumental allusions are intended for those who really need them.

As for the quotations from full scores, forming Appendix II., these, it is hoped, will perform the dual function of instructing the tyro in the matter of how the composer fashions his score and of warning the megalomaniacal symphonist. In districts in which the public is accustomed to consume its musical pabulum in annual doses of Handel's "Messiah," performed by a Gargantuan orchestra and an equally abundant chorus, it frequently happens that the hall is not large enough to accommodate both audience and performing body, with the consequence that a flautist may at any moment suffer from the accidental conversion of a trombone into an instrument of percussion, whilst the fiddler is unable, owing to the proximity of his fellow, to draw a full bow. One cannot well prescribe it a duty that a modern shall not rival the Georgian composer in the power thus annually to attract the habitually apathetic ; but one may be permitted at least to observe that whilst a composer need not necessarily regard himself and his kind as being " made for " a perpetually standardised orchestra, there must be limits, and that whilst a certain license is accorded to the artist—as to the poet—he remains liable, like the cabman, to have it endorsed should he occupy an undue portion of the road, or commit any other excess of the kind.

As a conclusion to these prefatory remarks it should be acknowledged that this little book cannot possibly fulfil its intended purpose unless the splendidly courageous efforts of a number of conductors and orchestras in London and the Provinces, whose financial remuneration is entirely incommensurate with the labour they expend, are enabled to continue. In the following chapters the problem of the orchestra and how to listen to it is fully discussed in all particulars save one. To publish a dissertation on How to be Happy tho' Married for circulation in an Eveless Eden would be the limit of futility. The present author will not, it is hoped, be accused of a lurking ambition to become a " best-seller " if he expresses a pious hope that the day may not be distant on which a locality that does not possess and support its own orchestra will be deemed unworthy to control its own destinies.

HARPSDEN GATE,
HENLEY-ON-THAMES.

June, 1917.

THE ORCHESTRA AND HOW TO LISTEN TO IT.

CHAPTER I.

THE ART AND SCIENCE OF LISTENING.

I.

In one of his *Unprofessional Sermons*, Samuel Butler, the younger, delivers himself of the following cynical precept for concert-goers: " To know whether you are enjoying a piece of music or not you must see whether you find yourself looking at the advertisements of Pear's (*sic*) soap at the end of the programme."

The procedure recommended by the author of *Erewhon* may enable the doubting concert-goer to arrive at a conclusive verdict, but it ought not to satisfy him, especially if he discover that his attention has been absorbed in a greater measure by the soap referred to than by the unmentioned symphony.

The concert-goer ought to be a little more ambitious, and his ambition should speedily increase as soon as he begins to seek knowledge; for the very beginning of the knowledge of what an orchestra is and does will reveal to him the possibilities of an immense enjoyment to which he has hitherto been a stranger.

If the listener, instead of contenting himself with remaining in what Mr. Arnold Bennett describes as a state of " beatific coma " * when a concert is in progress, will exact from himself the degree of intelligence applied in any other walk of life, he will soon grasp that he may easily rid himself of the necessity of avowing that while he " loves " or is " awfully fond " of music, he knows nothing about it.

For many years there has been developing, among musical educationists, a movement directed towards inducing the man in the hall to seek an understanding of musical construction, so that he may be able to discern the differences of dimension between one piece of music and another. It has been justly argued by the leaders of this movement that no sane man would make a practice of attending readings of poetry or prose delivered in a language of which he was ignorant; that such a man might derive a certain amount of enjoyment from the changes of tone representing the poet's emotional and the reader's interpretative transition from one mood to another, from joy to sadness or from love to hate; but that the listener must of necessity remain in complete ignorance as to the sentiments which gave rise

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* *How to Live on* 24 *Hours a Day*. (Frank Palmer).

to these changes. Such a listener obtains but a shadow of the sense of what is being read to him; he sees not a portrait but a mere silhouette, which counterfeits only the profile, gives but a vague idea of features, and, virtually ignoring facial expression, tells nothing of the soul.

II.

This educational movement, which was begun with the utmost caution, first directed attention to the necessity of perceiving the constructional features of music, and the study it recommended the unlettered music-lover to undertake was a comparatively simple one. It was intended simply that when listening to a piece of music the listener should strive to familiarise himself with the general principles of musical construction, that he should attempt to identify themes or tunes on their repetition, and should endeavour to follow the composer in his treatment of these melodic patterns and to observe the changes in harmony by which they are accompanied.

Fortunately this "musical appreciation" movement has been highly successful, and, thanks to its introduction not only into girls' but into boys' schools, there has been bred in Great Britain a race of young men and women whose influence upon the development of musical culture in these isles should prove immense.

There is no intention, however, that the improvement in the attitude of the public towards music should stop here, and, if it is to continue, the community of folk who like music despite their ignorance of its principles must be gradually replaced by a public of intelligent music-lovers whose appreciation is widened by a genuine understanding of the art.

Times have changed, and, whereas the large musical public formerly interested itself chiefly in solo-instrumental or vocal displays of virtuosity, it has now begun to understand that the orchestra is the supreme vehicle of musical expression, and that it represents a body of artists, each of whom, by means of an instrument, contributes to the clear expression of the musical thoughts of a revered genius.

There are still, nevertheless, many who are not yet able to recognise the tone of these instruments and have but the vaguest notion as to what is the kind and degree of each instrument's contribution to the whole sound-mass. Even if they know the difference between a symphony and a concerto, that the former is an orchestral piece in "sonata form" for orchestra and that the latter term usually comprehends a solo part for an instrumentalist whom the orchestra accompanies, many have not yet pursued their researches into the system upon which orchestral tone and balance are contrived, built up and fashioned.

III.

To listen to an orchestral performance without knowledge of its constituents and their method of sound-production and grouping is a form of diversion still somewhat widely indulged in by persons who would regard with no little scorn a friend who regularly attended football matches but was not aware that when the uprights of the goal rise above the cross-bar the game is that of the Rugby code, and who had in fact no knowledge of the technicalities of play. And yet there is no great difference between the mental effort required for an understanding of what is meant by a "pass" or a "try" and that which can secure an acquaintance with the tone-colour of a French Horn or grasp the significance of a "suspension."

The truth is that, with a few minutes' thought, the "unintelligent listener," the listener who has hitherto been the serf of his ears and has never actively made use of them, will be able to understand how easy it is to increase his enjoyment a hundredfold if he will devote a few hours' attention to a fairly simple matter. Having done this, he will forever afterwards meet music, not as a stranger whose features he daily admires from the opposite side of the street, but as a friend from whose intellect he constantly enlarges his own, whose physical attractiveness is but an outward token of profoundly interesting mental activity and psychological movement.

The most primitive concert-goer has only to understand that to treat orchestral music as though it were the unorganised sounds of an æolian harp is to deprive himself of one of the greatest joys of life, and he will surely resolve to penetrate the veil of ignorance that debars him from participation in this pleasure.

And there is no need for apprehension ; the veil is so fragile that, once pierced, its substance evaporates ; it presents no obstacle that a slight exercise of the will to know cannot overcome.

CHAPTER II.

THE ORCHESTRAL GROUPS.

I.

" IN the Theatre of Life," says R. L. Stevenson, " not only the walking gentlemen, singing chambermaids, and diligent fiddlers in the orchestra, but those who look on and clap their hands from the benches, do really play a part and fulfil important offices towards the general result."

The first thing to be learnt by " those who look on," those who wish to play their part by understanding what is being done, not only by the " diligent fiddlers," but by the whole band of performers on the platform, is the system upon which the instrumentalists are divided into groups.

If our researches are to be profitable we shall do well to make them during a concert of the " Promenade " variety, so that in order to pursue them advantageously we may move about from one coign of vantage to another. When we have learned how to listen and are prepared to " play our part," it will behove us to choose a seat with a due regard for the acoustical properties of the particular hall in which we find ourselves, for halls differ greatly in this respect. When making a choice we shall be wise enough, thanks to our knowledge of the various instruments and their functions, to avoid any such misapprehension as that betrayed by the person who placed the royal seats at the Brussels Opera House just above the drum department of the orchestra !

II.

At a first glance from a distance the orchestra will appear to be an assemblage of gentlemen in evening dress, and the extraordinary difference between the duties they variously perform will hardly be perceptible to the neophyte. Even if they appear facially similar, like the members of the Tariff Commission in the cartoon called "The Chamberlain Orchidstra," drawn many years ago for *Punch* by Mr. Bernard Partridge,—evidently in ignorance of Oscar Comettant's playful assertion (*Physionomies d'Artistes*) that both a physical and a moral influence are exerted by the particular instrument on which the musician habitually plays—we shall be able to discern with a minimum of trouble that, like the puppet-politicians in the cartoon, who are so faithfully echoing the opinions of the great conductor of the "Tariff Reform March," each member of an orchestral group has a different method of utterance, although his message is but a fragment of the general propaganda.

Before proceeding to an examination of the concrete orchestral body and its division into

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groups we may prolong the political metaphor—supposing politics to be better understood than music—by drawing an analogy between the conventional political grouping of a parliament and a grouping of the orchestra, which does not yet appear to have been employed. We may regard the Violin Party, with its emotional flexibility, as the Extreme Left, or Radical; the Drum Party, with its staunch adherence to rhythmic precision, as the Extreme Right, or Conservative; and the Wood and Brass Party as the Moderates who esteem the virtues while deprecating the prejudices, of the first two of the groups mentioned.

To appreciate the significance of this, however, we must first make ourselves familiar with the orchestra as it appears, after which our preception of sounds will enable us to estimate the value of the above comparison.

III.

The orchestra may first be divided into three primary constituents: (1) Stringed instruments, which are bowed; (2) wind instruments, which are blown, and (3) percussion instruments, which are struck. As examples which everyone will understand we may cite: (1) the Fiddle, from which sound is drawn by the rubbing of a bow over its stretched strings; (2) the Trumpet, which is made to sound by the air which the player drives into it, and

(3) the Drum, the stretched parchment of which protests when the drumstick falls upon it. The conventional terms for these categories are *Strings, Wind* and *Percussion.* The first is a little misleading, because it should embrace the Harp if taken literally, and might include the Piano—occasionally used in the symphonic orchestra—but does neither. A term which would suitably describe this group is *Bows,* but this, we believe, has never been generally employed. From this grouping we proceed to a subdivision into the various kinds of instruments appearing in the primary categories.

IV.

The bowed instruments, or *Strings,* comprehend the Fiddles, of which there are two classes, playing what are called the first and second parts, the Viola, or Tenor, of slightly larger, though otherwise similar, build, which plays a part lower than the fiddles, but not as low as the Violoncello, or 'Cello, a large variety of violin whose dimensions forbid its being placed under the chin and require it to be held between the knees of the player, and the Double-Bass, the largest in size and the lowest in sound of the string family. This group has long been known as the *Quartet,* but in recent times, as the Double-Bass music has become more and more independent of the 'Cello part—they used to be alike in contour, though an octave apart—the former instrument has been accorded rights of citizenship, and the term *Quintet* has proclaimed its emancipation.

The wind, or blown instruments may first be roughly divided into the two classes of wood and brass. Constituting the *Wood-wind,* as this group is called, are the Flute, with its auxiliary, the Piccolo, the Oboe, which has also a deeper voiced assistant in the so-called English horn—incorrectly described by both adjective and noun—the Clarinet, with its companion the Bass-Clarinet, the Bassoon, and Double-Bassoon. With the exception of the Flute and Piccolo, which are direct blown, these instruments are again subdivisible into single and double reeds, referring to the design of their respective mouthpiece contrivances—the Clarinets belonging to the former, and the Oboe, English Horn and Bassoons to the latter type.

To the brass family belong the Horn, the Trumpet, its simpler but less beautiful equivalent the Cornet, the Trombone and the Tuba, which has a bass relationship to the brass similar to that of the Double-Bassoon to the wood, and the Double-Bass to the strings.

The least constant group in the orchestral system is that of the percussion or struck instruments. Even the Kettle-Drum, which is the chief of the non-melodic units of the group, is sometimes dispensed with, while the use of its more ornamental but no more melodic fellows the Side Drum, the Base Drum, the Triangle, the Cymbals, the Castanets, the Tambourine, and the Gong depends entirely upon the sentiment of the music and the composer's method of expressing that sentiment. If the piece describes a carnival scene it is, of course, more than likely that all these instruments will be called upon ; if, on the other hand, the music is of a contemplative or dreamy character, they would hardly be found any work to do. The melodic percussion instruments are the Glockenspiel, a complete scale of silver-sounding bells, the dulcimer-like Xylophone, and the increasingly popular Celesta, which has the external keyboard and the internal hammers of the piano.

Standing outside these groups, and often especially conspicuous (apart from this and its appearance and prominent position on the platform) owing to its being played by a lady, is the Harp, an instrument which, thanks to certain improvements, has of late years commended itself to the modern composer.

The Harp, together with the majority of the percussion group, may be looked upon as an instrument which contributes embellishments and little that is really essential to the whole sound mass.

V.

When we begin to look at the orchestra for the purpose of identifying the groups and their constituents, we observe a large preponderance of bowed instruments, or *Strings*. There are at least a dozen violins on each side of the conductor, about ten violas, six 'cellos and four basses, and in none of the other groups will there be anything approaching the multiplication such as we find in the groups of the smaller members of the fiddle family.

It should be remembered that the dimensions of the orchestra are constantly undergoing modification, a condition due to the circumstance that music is an expressive and, therefore, a progressive art. Consequently the tendency of the orchestral system is twofold: to magnify in bulk with the increasing complexity of the musical art, and, having added both in kind and in number, to subdivide the larger groups, thus tending to increase the responsibility of the unit. When a modification takes place its origin is usually to be found in the wind section of the orchestra, in which the instruments, being of a more or less primitive kind, are constantly being improved, and new instruments are occasionally invented at the suggestion of a composer who requires a fresh medium of expression, a new colour for his palette. The strings have thus remained unchanged, as to kind, for over a hundred years, and the only change in their orchestral condition is that they are more and more liable to subdivision into different voices; but in the wind groups new members have appeared whose tone has added to the wealth of orchestral sound, and has called for a re-adjustment of the orchestral balance, in the wind as well as in the string section.

Variations due to the type of piece have also to be reckoned with, and if we take advantage of the chronological position of such composers as Mozart and Berlioz, and emphasise the difference of their demands, without calling attention to the class of work in which these demands were made, we shall produce an exaggerated impression of orchestral development. As a comparison, however, we may cite the Morzart symphonic orchestra, which was composed of about twenty strings and about nine wind instruments, and Berlioz's megalomaniacal monster, designed for the performance of his *Requiem*, in which the number of trombones alone reached sixteen, the complete company making a truly formidable array.

We shall now scrutinise the platform, on which the players are seated, and seek to establish in our minds their positions in relation to each other, and to ourselves as audience and spectators.

VI.

In order to facilitate visualisation of the orchestral plan, it is best to begin by considering its system as divided into the primary groups of strings, wind and percussion. The reader may here be warned that orchestras are not all distributed alike, varying according to the taste and judgment of the conductor, and conditioned as to plan by consideration of the accoustical properties of the hall in which performance takes place. But even were accoustic conditions constant and perfect, there can be no attainment of the ideal in the placing of the orchestral groups until it is possible either to dispense with the conductor, whose beat has to possess a high visibility for each individual player, or to convey the beat to the music on the stands by a process of " wireless." This would allow, amongst other *desiderata*, of all the fiddles facing the audience instead of, as at present, half of them pouring out their tone towards the back of the platform, in reality, a terrible piece of tonal extravagance.

The conventional plan, having regard simply to the primary groups, is as below—Fig. 1. It will be seen that, according to this, the three groups sit each in a compact body ; their positions in relation to the audience are determined partly by the comparative importance, to the listener, of the melodic, harmonic and rhythmic properties of music and qualities of the instruments, and partly in consideration of their power of penetration.

ORCHESTRAL CHART.

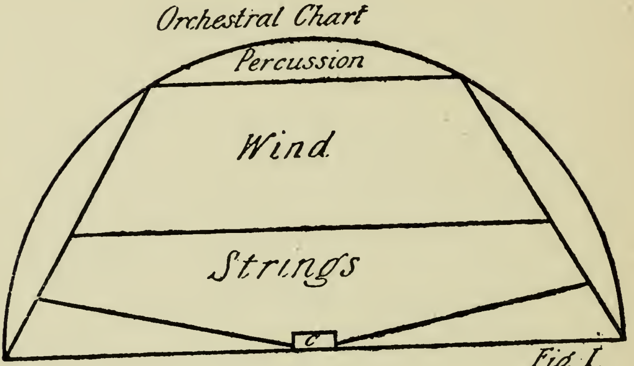

Fig. I

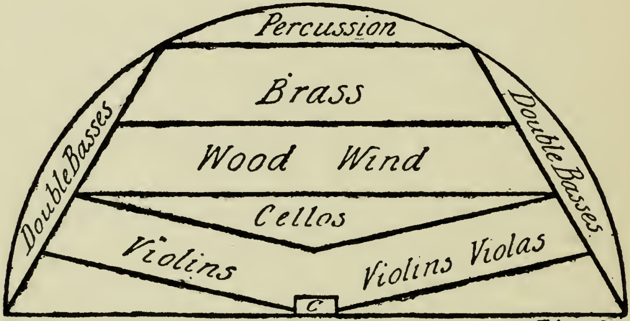

Fig. II

c – Conductor.

Fig. 2 shows the rough plan filled in, and it is now seen that the double basses are not adjacent to the smaller stringed instruments, but form, with the percussion group, a rampart round the orchestra, a ring, as it were, of sentinels whose duty it is to prevent rhythm from passing beyond its frontiers. The conductor, or commandant of this orchestral camp, by means of instructions given to his lieutenants—each variety of instrumental group having its nominal leader—sees to it that there is a *modus vivandi* among the musical elements, and thus the interests of melody, harmony and rhythm do not conflict, but, combining, form the compound element of tonal beauty.

We have called attention to the variability of the orchestral plan ; the music-lover, making a pilgrimage throughout the civilised world, will often be under the necessity of revising or re-designing his mental picture of the orchestra before the concert, at which he has sought to enlarge his experience, begins. Obviously, the golden rule is to learn to recognise each kind of instrument at sight ; the tracing of groups will then present no difficulty.

Before introducing to the reader's notice, however, the individual instrument, and explaining its functions, it will perhaps be best to give some description of the general principles of sound-production. The student will then be well able to understand the conditions which govern the construction of and performance upon these instruments.

CHAPTER III.

PRINCIPLES OF SOUND-PRODUCTION.

I.

THE reciprocal relationship between the listener and the player, which demands from the former the use of his intelligence if the efforts of the latter are to be fully understood and appreciated, will be seen to operate also between the player's instrument and the listener's ear. Everyone knows that the sound of a church bell possesses a curious quality of indefiniteness; this is due to the presence of notes other than the "fundamental," or most prominent note of the bell. But only the naturally acute or educated ear is able to discern these secondary sounds with sufficient clearness to be in a position to indicate their note by means either of the voice, an instrument, or the note's musical letter-name. Ere he begins to seek an understanding of the principles of sound-production, the would-be intelligent listener's attention may profitably be drawn to the similarity in the processes of sympathetic vibration between sound and colour. We may illustrate our meaning, in the manner of the old-fashioned, rudimentary text-books, by a homely example. Take a dinner-gong, a tumbler, or any other resonant object that happens to be at hand, into a room ; begin singing loudly and you will hear certain of your notes echoed by these objects ; these notes are sounded, by sympathetic vibration, on every occasion on which your voice " mentions " the notes contained in the objects.

Despatch a friend who is wearing a blue hat into your garden, and from your window you will perceive that every blue flower will at once have its colour intensified, and will be called into prominence like the notes of your resonant objects. The sharper the ear and the clearer the eye the more will these effects be respectively audible and visible.

It behoves the listener who would be successful to listen hard, to seek out sounds with his ear so that he may hear more than the sounds which actually force themselves upon his attention.

All sound is the result of vibration. Even vibrations produce pleasant sound, or tone, uneven, unpleasant, or noise. Slow vibrations produce low notes, quick ones high. Strong vibrations produce loud notes, weak ones soft. String vibrations produce one quality of tone, those of a column of air in a tube another, while a stretched membrane answers to a tap with the least pleasant quality. The various tone-producers of the orchestra are different in structure, substance and shape ; hence their different tonal effects.

II.

The process of sound-production in an orchestral instrument is probably unfamiliar to the majority of frequenters of orchestral concerts. Upon an acquaintance with this process, however, depends a proper appreciation of instrumental technique, and of a composer's dexterity in its exploitation. Fortunately this process may easily be understood.

By an individual totally unversed in physical science, a string might be supposed to vibrate at a certain rapidity, determined by its length, and to give forth a single note when disturbed into vibration by contact with another substance. Such an individual, so long as he remains a listener, cannot be said to exist in perpetual danger as a result of his ignorance; but, as a knowledge of the true condition of affairs is the foundation of everything the musician knows about and does with the orchestra, there would seem to be sufficient reason to expect that a conscientious listener should acquire at least a slight comprehension of the matter.

A string, a column of air or a stretched membrane, when disturbed, vibrates not only as a whole, but in segments, or equal parts or fragments of its whole length. The vibration of the whole length is naturally the slowest, and produces the lowest sound; the smaller the vibrating fraction the quicker the vibration, and the higher its sound. In the terminology of musical science the note produced by the whole vibration is called the *fundamental,* while those set up by the fractional vibration are called *partials.*

In an instrument such as the fiddle it is easy to alter the fundamental by shortening the string with the fingers; it will be readily understood that were wind, or "blown" instruments to depend upon this system they would have to be of so embarrassing a length as to render them quite unwieldy for human hands. It is here that the partials come to the musician's aid. His fundamentals are altered by varying the length of his air column, his partials are obtained by varying the wind pressure, and thus producing a different segmental vibration at will—each fundamental possessing the power of furnishing a series of partials. Thus, if an instrument, or column of air, gives a certain note, conditioned by its length, that note may be altered by increasing or diminishing its length, and at the same time the player can, by varying the wind-pressure, select certain partials from any of his lengths. If the fundamental be, for instance, the note an octave below "middle C," the vibration in halves, or at double the rate of the fundamental, will produce a note an octave higher, namely, "middle C" itself; if from the same fundamental we call forth vibration in thirds, or at three times the rate of the fundamental, there will be produced the note "G above middle C," a twelfth above the given fundamental. Whatever be the note taken as fundamental, a double rate of vibration of whatever body is the note-producer will always bring the fundamental's octave; a triple rate, its twelfth. All the partials have this relation towards one another, a doubling of the rate of vibration (or halving of the vibrating segment) producing an octave, and a trebling a twelfth.

Finally, it should be remembered that the partial tones weaken in power in proportion as their vibrations increase. It may here be stated, in order to prevent confusion, that the partials are known by other names, such as *overtones* and *harmonics*; in the following pages the first term will be adhered to.

III.

Now the partial-producing capacity of wind instruments varies in accordance with the difference in their structure and substance. Those having, for example, a cylindrical tube, like the clarinet, are only able to produce the odd-numbered partials, which signifies that the note sounded on a string by the double rate of vibration, which, as we know, is an octave above the fundamental, is not obtainable on the clarinet, by ordinary means, and in this the clarinet differs from the oboe and bassoon, of which the tubes are conical.

As well as this difference in tone-producing capacity, there is also that resulting from the use of two different kinds of reed, namely, the single reed of the clarinet and the double reed of the oboe and bassoon. Through this contrivance the air in the tube of the instrument is set in motion, and owing to the indirect or alternating nature of the air supply, caused by the vibrations of the reed, the partials are more easily reached and sound the more readily. The smoothness of clarinet tone is traceable to its single reed, whilst the pungency of oboe and bassoon is the result of the action of the double reed. The rule of construction is that a cylindrical instrument has a single, a conical, a double reed. The saxophone constitutes an exception to this rule, being a conical brass instrument blown through a single reed.

IV.

In the brass instruments there is a greater partial-producing capacity than in the wood, but the primitive horn and trumpet were handicapped by being able to play only in the key in which the instrument had been built. The notes were made by calling upon the different partials by means of changing the air-pressure, and not, as in the wood instruments, by altering the length of the air-column. In the primitive, or natural horn, for example, the note-producing capacity was therefore, strictly limited, and only when the device called the " crook " was invented did its flexibility increase. The "crook," a small bent brass tube, when introduced into the tube-length of the instrument, served the purpose of altering its pitch, and thus its key. But while the range was increased by the crooks it was always necessary for composers to allow time for them to be inserted, and this difficulty remained until the addition of permanent valves, or pistons, was introduced into the mechanism. When a piston is pressed down, the length of the tube is altered and the instrument's key is changed. So that the brass instrument, instead of being confined to a small set of notes can, by manipulation of its length through the operation of valves or pistons, reproduce this series in a number of different keys. The trumpet was originally subject to the same conditions as the horn, and has undergone a similar development. The trombone derives its flexibility not from valves, but from the slide, which, when pushed away from or pulled towards the player, alternately lengthens or shortens its tube. The drum, the chief member of the percussion group, is obliged to alter its tuning for every change of note, but as its function is much more frequently rhythmic than melodic, this does not involve a great deal of trouble. The use of a considerable group of kettle-drums, tuned to different notes, has not yet been exploited by composers, probably owing to the expense such a procedure would involve. Until, therefore, a method of rapid pitch-alteration has been devised, the kettle-drum cannot be promoted to the rank of a melodic instrument. But as composers have recognised and availed themselves of the infinite dynamic variety of which the kettle-drum is capable, it is not without the range of of possibility that the required mechanical contrivance may be discovered.

CHAPTER IV.

INSTRUMENTS AND THEIR SOUNDS.

I.

In this chapter an endeavour will be made to familiarise the reader with the shape and proportions, the sound-producing capacity and the tone quality of each instrument of the orchestra. Only the established orchestral instruments will be described, and if the "battle symphonies" of the future include in their scores instruments designed to imitate the music of high-velocity projectiles or of the flight of dirigible air-machines, this chapter will have to resign itself to obsolescence. The instruments will not be treated in chronological (historical) order, but in something approaching their degree of importance in the orchestral scheme.

II.

THE STRING OR BOWED INSTRUMENTS.

The Violin is, with justice, called the "king of instruments," and it has an eminent title to its supremacy in the orchestral kingdom. It is the superior of any other in compass, in velocity of execution, in the smallness of its demand upon the player's endurance, and in its perfectly graded tonal power. It belongs to the only instrumental type, excepting the harp, that is able to play chords, and in its capacity for sustaining a note is rivalled by none and hardly yields even to Time ! These qualities are common to the whole fiddle family, but are possessed by the larger members, the viola, 'cello and double-bass in a less degree. Finally, this type of instrument has also the greatest variety of tone-producing methods. Its heavy and sustained chords recall the sound of the organ. Its singing, or *cantilena* passages rival the human voice in beauty and surpass it in flexibility. Its dancing bow can be made, at the player's will, to suggest the fleet footsteps of a fairy, or to lend a puckishness to the music resembling that which characterises the sounds of the piccolo.

The tremolo, or shivering sound, produced by small and rapid strokes, is the composer's medium, *par excellence*, when he desires to make our flesh creep.

The fiddle is able to imitate the flute, and when the strings are plucked instead of bowed, the effect in low notes resembles the drum-tap, in higher, the harp. Its harmonics, or partial notes, are in complete contrast to its ordinary tone, the difference being, in degree, that between a viscous fluid and water. When its *mute* is in operation the violin acquires a tender or mysterious quality of tone which may be described as the feminine of its usual sounds. The fiddle is, in fact, an orchestra in itself.

The structural feature of greatest importance amongst those from which its sound-producing capacity emanates is its set of four strings, G D A and E tuned a fifth apart, four notes (with their semi-tones) being producible on each string by the four fingers in addition to that obtained on the "open string." The range, or compass, of a string, which extends for about two octaves, is, of course, fixed at its bottom extremity by the open, or string note; the higher limit depends on the tonal properties of the individual instrument; the whole compass of the violin is about four octaves; this again is definitely bounded below by the note of the lowest or G string, a good violin being better able than an inferior one to produce the very high notes in the top section of the E or first string—sometimes known, for its singing quality, as the *chanterelle*.

The principle on which the violin's notes are made is that of the stretched string, which, when disturbed by a foreign body, vibrates—the note depending upon the length of a string at a given tension. In the fiddle, the length is determined by the nut, over which the string runs from the tightening peg, and the bridge on which it rests near to its other extremity, which the tail-piece or string-holder constitutes. The nut and bridge may, therefore, be described as interceptors, which are fixed, and cannot vary their relationship towards the string. The latter, in consequence, gives always the same note, until its length is altered by the fingers—the mobile interceptors.

To show the working of this principle we need only examine the process of placing the first finger on the lowest, or G, string at a short distance from the nut, or bottom interceptor. The said first finger has become an interceptor, the string has been slightly shortened and sounds no longer G, but A—a tone higher than its open note. This process of interception or pressing the finger on the string is called "stopping." When chords are to be played the bow is laid on two and sometimes three strings simultaneously, and these strings are stopped by the fingers according to the notes required.

Access to the whole compass of the instrument is easily gained by shifting the hand from one position to another. When the hand is near the nut, or lower interceptor, it is said to be in the first position, and the compass is for the time being restricted to the notes between that of the lowest or G string and the fourth finger note on the highest or E string, namely, B; but as the hand is shifted up to the higher positions a new set of notes is reached on each string and the lower notes are stopped with a different set of fingers. Thus, when the hand moves to the third position the E string yields two notes more than in the first, and the other three strings temporarily lose their open, first and second notes; in this position, therefore, the lowest accessible note on the instrument is the third stopped note on the G string, namely, C. By shifting his hand up and down what is termed the fingerboard of the fiddle the player has at his disposal a greater number of notes than are obtainable on any other of the regular orchestral instruments, and is able to play them with a velocity that cannot be excelled.

The tonal resources of the violin family have also a greater variety than those of the other members of the orchestra. The bow can be used in a number of ways, each of which brings forth a totally different effect from the strings.

There is the detached or separate stroke, the legato, or bound stroke, covering many notes in the one bow's length, the staccato by which the bow produces a succession of short separated notes and the " spring-bow " method, causing the bow to leap from the strings between the notes of a rapid passage. Furthermore, the player is occasionally asked to turn his bow over and tap the strings with its wood (*col legno*) instead of rubbing them with its hair. He can, too, dispense with the bow altogether and pluck the strings—a process known as *pizzicato*. By lightly touching his string, instead of stopping it, he can call forth its harmonics or partials, and by means of the mute, a small ebony gripper, which is placed on the bridge, he can restrict its vibrations, thus reducing the tone to a nasal version of its natural full-throated song. The violinist has, therefore, a large number of tones of voice in which to express the composer's message, and in addition to these there is the *vibrato*, a rapid oscillation of the left hand, which produces an emotional tremour. This source of expression is not referred to in printed music, but as most violinists are prone to resort to it on every occasion, it is probable that composers will sooner or later adopt the precautionary measure of indicating the places in which they desire it to be used.

Owing to their capacity for rapid playing, variation of tone, volume and quality, and the small demand made by them upon the player's endurance, the stringed instruments are given a large proportion of prominent melodic passages, the first violins having the lion's, or, perhaps one should say, the linnet's share of melody in an orchestral composition. On occasion each group is divided into separate parts or voices, but the violins are always divided into two groups.

The SECOND VIOLINS, as to structure and method of playing, are identical with the first. Their part is essentially that of a second voice, but at times they are used to strengthen that of the first, as, for instance, when a large body of wind instruments would otherwise smother the unaided first fiddles. Generally the second violin player needs almost as much dexterity as the first, but he has to be content with less melody.

The VIOLA differs, physically, only in size, from the violin. Tonally its pitch is lower, its four strings beginning a fifth below those of the violin, and its sound is of quite different quality, owing to the greater thickness of its strings.

Regarded for a long time as the Cinderella of the orchestral quintet, and largely as a useful means of filling in the harmonies of a chord, the viola has of late years been accorded a proper recognition.

Berlioz,* explaining its former lowly condition, remarks that players of this instrument " were always taken from among the refuse of violinists " ; the result of this was that composers did not care to entrust significant passages to such faltering interpreters, and, consequently, the player was given the kind of music he deserved. Now, however, thanks in a large measure to the untiring efforts of Mr. Lionel Tertis, himself an unrivalled exponent, all has been changed, and the viola has been invested with the responsibilities of a solo instrument, both in a literal sense and in its relation to the orchestra, in which its position is no longer a humble one.

The tone quality of the viola is often described as mournful, suggesting melancholy, but to many its tone colour conveys an impression of irony rather than that of atrabiliousness.

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* Treatise on Modern Instrumentation and Orchestration.

If this instrument's utterances are often pessimistic, they are delivered in a voice that hardly conceals a certain jauntiness ; its tone is thus more suggestive of sarcasm, and is more engaging than if its mood were unrelievedly gloomy. The viola's mechanism is virtually identical with that of the violin, its articulation being less flexible and ready than the smaller and thinner-stringed instrument.

The VIOLONCELLO will easily be recognised by the veriest tyro whose acquaintance with the string family has fallen short of this instrument, since it is a large type of violin, too large to be held under the chin and is thus placed, in a reversed position, between the player's knees. In contradistinction to the violinist, who brings his left hand towards him when ascending the scale (or shortening the string) the 'cellist pushes his away from him. The 'cello, like its smaller relations, has four strings, the top, or A string, being tuned an octave below that of the viola ; the two bottom ones, G and C, are wrapped with silver thread. Owing to the length of its strings, the distance between the notes is much greater than on the violin, but not so great as to interfere with systematic fingering. One feature of its system is the employment of the thumb of the left (fingering) hand ; the thumb is placed on the finger-board, forsaking the position in which it is maintained by violinists, who hook it round the " neck " of their instrument ; this enables the 'cellist to reach with ease the upper register, *i.e.*, the notes nearer the bridge. The thumb is also used to stop the lower notes in octaves. The tone of the 'cello is a valuable adjunct of orchestral colour. "Nothing is more voluptuously melancholy," says Berlioz, "or more suited to the utterance of tender, languishing themes, than a mass of violoncellos playing in unison upon the first string. . . . The two lower strings, C and G, especially in keys which permit their employment as *open strings*, are of a smooth and deep sonorousness. . . ."

The 'cello is to be regarded as the bass of the string quartet, but as a mobile bass, giving utterance, like the higher-voiced instruments, to sustained expressions, and not merely to ejaculations. It has not always, however, been thus considered. Mozart rarely treated it as an independent instrument ; Haydn hinted at its potentialities as an expressive vehicle, but "it remained for the genius of Beethoven," says Gevaert, * to sever the shackles which held the 'cello chained to its ponderous partner (the double-bass) and to enrich the choir of bowed instruments with a fifth voice, more melodious and pathetic than any other.

And the 'cello has shown how worthy of its freedom its resources enable it to be. The modern composers, who have increased its responsibility, have been rewarded by the accession to the orchestral body of a new expressive medium, for the 'cello has proved itself to be hardly inferior in general flexibility to the violin itself, from which instrument it differs very little in its variety of musical effect.

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* New Treatise on Instrumentation.

Its singing qualities are more alluring in certain positions, its harmonics have greater body, its plucked or *pizzicato* notes are more sonorous and have a fuller or more bell-like tone, and its capacity for rapid passage-playing has immensely increased since the newly-enfranchised 'cellist has determined to manifest his fitness.

The 'cellos in the orchestra are not, as are the violins, separated regularly into two sections, but they are frequently divided into different voices, when the contrast in tone quality between the strings of this instrument becomes clearly marked.

When, on occasion, it joins the ponderous partner referred to by Gevaert, its big volume of warm tone greatly enhances the voice of the double-bass.

The DOUBLE-BASS is the largest (requiring its player to stand upright), deepest-toned and least wieldy of the string family. To its original tuning of three strings, a fifth apart, came, towards the beginning of the nineteenth century, an extra string and a revised arrangement, in accordance with which they were now tuned in fourths. The uppermost string is now the G, an octave beneath the lowest on the violin; the bottom string sounds E; abroad, a five-string instrument has been used, with a lowest string a third below the E or fourth string. The reason of its tuning in fourths is that the distance between notes on this gigantic finger-board is so great that the human hand, with index and little finger extended, cannot cover more than one whole tone, while even a half tone is only to be stretched by the wide membrane between the first and second fingers. It is therefore necessary to diminish the compass to be dealt with by the hand on each string.

The double-bass has been described above as a sentry whose duty lies in keeping rhythm within the orchestra, and this it is frequently called upon to do by emphasising the strong beats of a bar. Although it is incapable of the rapid passages to be obtained from the violin, viola or 'cello, such dexterity as is possible is, on occasion, exploited to the full. With such length of string one can well imagine the player to long for a kind of seven-league glove, in order that the execution of the huge leaps he is obliged to make, when covering the distance between notes, might be facilitated.

The double-bass player finds his notes written an octave higher than the pitch at which he is required to play them; this is due, in the first place, to that partnership with the 'cello to which we have referred; before its dissolution the basses played from the same music and transposed their parts an octave lower, but since their separation it has been found expedient to continue the practice in order to avoid the trouble of writing or engraving the many leger-lines below the stave which would be necessary were the basses' deep-voiced part written according to its real sounds.

It will readily be understood that the double-bass is in every particular a much less flexible and articulate instrument than the smaller members of its family. Its inability to produce highly expressive or emotional music is no doubt the ground on which it has been considered, in certain northern climes, a more virtuous instrument than the "wee wicked fiddle." The great length of its strings and their comparatvely slow rate of vibration lend to its tone a gruffness which renders the instrument a good servant, a disciplinarian, in fact, one whose somewhat domineering tones are best appreciated when used on one's own behalf. Its bow is very short, and its music has to be designed as though for a singer with a short breath; its harmonics are restricted within a much smaller range than that of the 'cello, viola and violin, and its *pizzicato* is used rather as a method of punctuation than for decorative purposes.

Because of its lack of genial tone and of flexibility, the double-bass is very rarely given a prominent voice in the delivery of the orchestral message, although it is often entrusted with passages which are melodic in nature, and the group is occasionally favoured with that subdivision recorded in respect of the smaller stringed or bowed instruments, being divided into sections producing different melodic or harmonic parts. That the double-bass is an instrument from which more will be asked in the future seems highly probable, as certain enthusiastic players, such as Dragonetti, Bottesini and the celebrated Russian artist, Kussevitsky, now a famous conductor, have proved it to be capable of interpreting music far more complex than that hitherto apportioned it by writers for the orchestra.

III.

THE WOOD-WIND INSTRUMENTS.

We now come to the groups of instruments in which the note-producing system embraces the partials or harmonics, not as an extraneous aid to the production of a variety of tone, but as a fundamental source of sound.

The more important of these groups is that known as the Wood-Wind, consisting of the direct-blown Flute, the single-reeded Clarinet, the double-reeded Oboe and Bassoon, and their diminutive and augmentative auxiliaries, the Piccolo, Bass-Clarinet, English-Horn and Double or Contra-Bassoon. These instruments form, like those played with a bow, a family, but both in outward or physical appearance and in their tonal qualities there exists a far greater diversity than that observable in the strings. The fiddle family consists of a set of instruments of one type, and its members might be roughly described as having all the appearance of a violin seen through magnifying glasses of varying strength ; but between the Flute and the Bassoon there is little or no resemblance, either in dimensions or tone-quality. Even if we allow that the position in which the clarinet and oboe are held by their players might make for confusion, we know that a very slight attention will reveal the difference in reed at the one extremity and in bell at the other, while the contrast in tone, once noted, could never be forgotten.

This variety in tone quality is fully exploited by orchestral composers, who employ the wind instruments on some occasions as soloists in order, as it were, to obtain a different emotional version of a musical sentiment, and on others in combination, securing by means of a diversity of combination, a series of effects comparable to the painter's mixture of colours selected from his palette. To the experienced listener the combination, for instance, of oboe and bassoon, is instantly recognisable as such by its tonal result, and the listener is either consciously or subconsciously aware of the identity of the contributory instruments.

In the arrangement of the wood-wind instruments in the score, or conductor's part, now prevailing, the flute is at the top, occasionally ceding precedence to its diminutive, the piccolo ; then comes the oboe, with its companion the English horn, then the clarinet and bass clarinet, and finally the bassoon, which in the wood department is the equivalent of the 'cello, having also its " double " or augmented or deeper variant in the double-bassoon. In this order we shall now describe the structure, tone-quality and functions of the instruments of this wood-wind group.

The FLUTE is easily identifiable, since it is the only wind instrument which projects sideways at a right angle from the body, or, more precisely, the head, of the player. With its appearance of a longish thin tube, fitted with metal keys, and blown by the player through a hole near the left end, it can hardly be mistaken. As to the position of the player in the orchestra, he will be found either on the extreme left (from the auditorium) of the wood-wind group, or in the forefront, if the group be arranged from front to back.

To define the tone-quality of the flute is not so simple, for to judge by the variety of opinion expressed by authorities, the character of the instrument must vary according to the temperament of the listener ! Dryden, who heard from the flute a " soft, complaining " utterance, is not violently contradicted by Rockstro, the biographer of Handel, who describes flute tone as something between the nasal tone of the oboe and the hollow sound of the cooing of a dove. Gevaert also sees in it an inhabitant of the woods ; its sound, says he, recalls the warbling of birds, the singing of the breeze, but is lacking in the vibrant accent of passion, an opinion that appears to conflict with Aristotle's, for he it is who admonishes parents and guardians, warning them not to allow their children to learn the flute, which is not a moral instrument, but rather one that will inflame the passions. Berlioz, however, looks at both sides of the question, averring that while the flute might appear to be "well-nigh devoid of expression" this instrument displays "an aptitude for rendering certain sentiments in which no other instruments can compete with it." The truth is that only a portion of the flute's expressive capacity was known to Berlioz, and although prior to him it had been emancipated and developed by Haydn and Mozart, it remained for another Frenchman, Debussy, to discover that, in its middle and lower registers, the flute has a loveliness of tone which for ages had been ignored, and which is in the greatest possible contrast to its upper notes.

The notes of the flute are producible primarily by blowing across the aperture at the upper end of the instrument, but the note is altered by manipulation of keys which operate on the length of the tube, thus obtaining a change similar to that wrought by the "stopping" of the violin string with the finger. The effects thus obtainable are limited to the lowest or natural scale of the instrument, that of D, to which the note below, middle C, can be added. To reach the higher scales it is necessary to create a new condition, *i.e.*, the production of a new fundamental, or, in other words, the second partial of the harmonic series. This is secured by the process known as "overblowing," which is nothing but an increase in air-pressure. With the instrument in this "second partial" condition its scale is based on a fundamental an octave higher than when in its normal state, and thus a second scale becomes available. A third scale or octave is brought into play by a further increase of breath, assisted by the opening of vent-holes in the tube. The flute has therefore a compass of three octaves.

The flute possesses the power of varying its articulation, being capable of playing sustained, smooth melodies, or passages in which the notes are quick and detached. It is thus often heard in conjunction with the upper stringed instruments, and in its capacity for rapid repetition of notes it approaches them more closely than any other of the wind instruments. This repetition is produced by a process known as "double-tonguing," which consists in an emission of breath in a series of miniature explosions, which are comparable to the rapid articulation of the letters T and K, and which may be imitated by quickly repeating the syllables Te-Ka in alternation. Double-tonguing is to be regarded as the equivalent, in relation to the normal effect of the instrument, of spring-bowing on the violin.

The PICCOLO is really a small flute, being somewhat less than half its size, and is of approximately the same construction. Its notes are rather more aggressive, harder in quality, and the highest in pitch of the wind instruments. Its part lies usually in adding, as it were, an " edge " to their tone. Like the double-bass its music is written an octave away from the notes it is required to sound, in this case lower, in order to avoid upper leger lines. Excepting in heavily-scored works the piccolo is played by one of the flautists.

For the observer in the audience at an orchestral concert it will be easier to discern the sound of the oboe than its physical appearance. It is this instrument which gives out the A, to which the orchestra tunes, and as that is not done until the whole *personnel* is assembled, there may be some difficulty in discovering the source of the persistently reiterated note, though none in hearing so penetrating a voice.

The OBOE is an instrument of conical bore, made, like the flute, of wood, and fitted with metal key apparatus. The wind power by which its vibrations are set up is introduced through a double reed, which is held between the player's lips. At its lower extremity the instrument widens out into a " bell " and is supported by the hands in a position sloping downwards and outwards towards the player's knees. The reed is constructed of two fine pieces of cane, arranged one above the other in a fashion just allowing of the passage of air between them. These pieces are wrapped with a silk thread, binding them on to a metal tube, or " staple," which enters the blown end of the oboe. It is because of the aperture through which the breath travels that only a small quantity of air can be used; the player is obliged to supply a constant and well-controlled stream of air, and thus to keep his lungs full—a very tiring business. The fingering is in large measure similar to that of the flute. The natural or normal scale, which is in D, is obtained by using the holes pierced in the side of the instrument, and the upper part of its compass is secured by overblowing.

The tone-quality of the oboe has been described with rather more unanimity than that of the flute. According to Berlioz, " candour, artless grace, soft joy, or the grief of a fragile being are the characteristics to be discovered in its accents"; while attributing to it "a certain degree of agitation," this authority finds it necessary to warn composers not to "urge it into utterances of passion or violent outbursts of anger, menace or heroism; for then its small acid-sweet voice becomes ineffectual and absolutely grotesque." Gevaert refers to the oboe's consoling tone and suggests also that its mission is to sooth when violence has been provoked. "The oboe," says the Belgian authority, "communicates a fresh perfume of youth to a melody expressing a simple and ingenuous sentiment," and he recalls Gretry's dictum that the oboe brings "a ray of hope in the middle of torments."

The piercing quality of the oboe's tone renders it highly suitable as a solo instrument, and melodic passages may be allotted to it, even when a number of others are playing, without fear of their being smothered. Exceedingly effective in the playing of passages of a "singing" character, its incisive tone in a series of quick, sharp notes is one of the composer's favourite media; the oboe is not, however, adapted for the process of double-tonguing, and its capacity for speed in staccato passages is therefore restricted.

The oboe is reckoned a soprano instrument. Its alto partner is the ENGLISH HORN. It is obvious that this name, which has been given to it, apparently, on the *lucus a non lucendo* principle, for it is neither English nor a horn, is a translation of the French term, *cor anglais,* which, the authorities suppose, is a corruption of *cor anglé*, the adjective having in earlier days described an angular shape. Even this is no longer to be counted upon as a clue to the identity of the English horn, for it is a quite straight instrument, half again as long as the oboe, and differing from it also in having a curved "staple," or mouth-piece tube, a thicker reed, and a pear-shaped extremity or bell, which reaches down to the middle of the player's calf. Its tone, however, is quite distinctive, and, when played in passages of a flowing character, the English horn is one of the most beautifully mellow instruments in the orchestra. It will usually be found in the hands of the oboist, who is called upon to take up the lower pitch instrument, just as the flautist resorts to the piccolo. Its fingering is virtually the same as that of the oboe, also its compass, but owing to a greater length of tube, the English horn is pitched a fifth lower than its soprano partner. The extraordinary richness of its lower notes compensates for the unsatisfactory quality of its high ones.

The description penned by Berlioz of the tone of the English horn applies admirably up to a certain date: " . . . its quality," says the Frenchman, " less piercing, more veiled, and deeper than that of the oboe, does not lend itself so well as the latter to the gaiety of rustic strains. Nor can it give utterance to anguished complainings; accents of keen grief are almost beyond its powers. It has a melancholy, dreamy, and rather noble voice, the tone of which possesses a vague, *remote* quality that renders it superior to all others in exciting regret and reviving images and sentiments of the past, when the composer desires to touch the secret chords of tender memories." But its use by Richard Strauss, for purposes of humour, shows that it is capable of expression other than that assigned to it by Berlioz or Dvorak, whose employment of the English horn in his New World symphony is perhaps the most noteworthy appearance yet made by this instrument.

The Clarinet, though comparatively a newcomer in the orchestra, has become one of its most important instruments, in respect both of melodic and harmonic contribution to the symphonic picture. It is capable of a good range and speed, its tone is beautiful, and its power can be greatly varied. In the first two respects, however, the clarinet, by reason of its structure and certain idiosyncracies of its natural sound-producing capacity, which have been wonderfully organised by the various experimenters and manufacturers, triumphs over great difficulties, and the player, giving an impression that the clarinet is easy to play, conceals the artifice by which this seeming ease is secured. The instrument is, in fact, an example of how far those who contrive orchestral effects for our delectation—composers, instrument makers and players—are prepared to go in order to offer us a significant and beautiful tone-quality, a colour in the composer's palette and a new enchantment for the listener's ear.

The clarinet reveals, perhaps more than any other orchestral instrument—apart from the string section—the temperament and the degree of artistic sensibility possessed by its player.

Owing to the already mentioned peculiarities of its sound-production, the clarinet's tone varies somewhat widely as the register is traversed, and, apparently, it is to be made to sound even and consistently pleasant only by those players who possess, besides a full technical dexterity, so great a love of tone-beauty as to be ever watchful against the intrusion of anything in the nature of a blemish. It will not be difficult to identify the clarinet. Made of dark wood, or ebonite, it has a metal key system, but it is externally different from the oboe, though held in approximately the same position, in its trumpet-like bell and its wedged-shaped mouthpiece, joined directly to the top end of the tube, thus concealing, from the distant beholder, its reed.

The reed of the clarinet is single and rests beneath the lower side of the mouthpiece, which is in shape a curved bevel. It is kept in position by a kind of clamp called a *ligature*. The player's breath, passing through the orifice between the mouthpiece proper and the reed, causes the latter to vibrate and so sets in motion the air column within the tube.

In its side the clarinet has a series of holes like the flute, and these, when successively opened, give the notes of its lower octave, or *chalumeau*, recognisable by a tone almost as mellow as that of the English horn, but less expansive. Owing to a peculiarity of the cylindrical tube, which possesses none of the even-numbered partials, the over-blowing, or increase of pressure, does not produce, as in the conical, bored instrument, the octave, but the next note of the harmonic series—a fifth above the octave or twelfth above the fundamental note of its tube—the clarinet is obliged to resort to artificial means of producing the intervening notes, by the use of extra holes covered by keys, which are, of course, lifted at the player's pleasure. The notes thus obtained constitute that unsatisfactory section of the clarinet compass known as the "break." From the top of this break a further octave is produced by overblowing; this is the middle register, in which the tone is at the clarinet's best, and above that again, obtainable by still greater air-pressure, lies the high or uppermost section of its compass where the sound becomes unpleasantly acute and almost shrill.

It is partly because of the complexity of fingering in the system of an instrument on which keys having many sharps or flats are exceedingly difficult, and partly because of the "break" which is something to be avoided, if at all possible, that the clarinettist smooths his own and the path of the composer too, by employing three varieties of instrument, each having a different pitch. These are known as the C, or normal (though becoming obsolete), B flat and A clarinets; the B flat instrument (usually called B clarinet) and that in A have the same fingering as the C, so that the second, when the finger plays the note C upon it, emits the note B flat and the third A. The break can be avoided, therefore, by having the notes in that section played on the instrument on which they occur outside the danger zone, and, further, the difficult keys can be approached on the type of clarinet for which they present least difficulty. The contrivance is roughly the equivalent of changing gear in a motor-car or bicycle in order to surmount a difficulty of gradient. If we imagine a composer, who, instead of writing in notes, adopts gradients as his medium, and, instead of hinting that such and such a passage should be played by such and such a clarinet, directs his interpreter to use his second gear for a certain slope by which he expresses a particular musical thought, we shall obtain some idea as to the purpose of this duplication in the orchestra.

The tone-quality of the clarinet is distinguishable from that of the instruments played through a double reed, the oboe and bassoon, by its more vocal sound, which is in complete contrast, in all but its very lowest notes, with the somewhat nasal sound of the oboe and the guttural quality of bassoon tone. The clarinet is quite expressive, but has less intensity either in joyful or melancholy passages than the oboe, and cannot approach the lightness of heart of which the flute is capable. It is well described by Berlioz as an "epic" instrument. Its expression may be characterised as that of one

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who contemplates and is affected by the emotional experiences of others, but does not directly experience them. But while it is in a sense detached, or perhaps platonic, the clarinet has by no manner of means a soulless voice, and examples are easily to be heard, in the orchestral concert, in which the clarinet's description of the emotions to which other instruments give expression is, if less passionate, sometimes of a more abiding beauty.

The Bass Clarinet, of still more recent origin than the clarinet proper, is not to be heard in the classical symphony, and its earliest use is apparently that of Meyerbeer in his *Huguenots*. As it is given some prominence by Wagner, Tchaikovsky and other modern composers, an acquaintance with its dimensions and tone-character is advisable.

In size and shape it differs from the ordinary clarinet, from which it originally sprang, being longer and having its mouthpiece pipe and bell bent back towards the tube, in order to avoid undue length. Whereas the bell of the smaller clarinet is of wood, like the tube, this part of the bass member of the family is of metal. In pitch this instrument is an octave lower than the clarinet. Its tone in the lower register, which is that oftenest employed, is not dissimilar from that of the clarinet, but an added profundity brings with it a certain individual character ; this has been variously described, but the "sacerdotal accent" which Berlioz hears in it is the peculiarity best to be sought as a clue. It will, however, easily be identified during a performance of Tchaikovsky's "*Nutcracker*" Suite in which it enters with an odd little scale-passage after a few bars from the celesta in the opening of the Fairy Sugar-plum number, and only a little less easily in the first movement of the same composer's Pathetic Symphony, where the bass clarinet descends to its depths with the familiar theme, conducting it to the vanishing point of tone specified by Tchaikovsky's "*pppppp*."

The sacerdotal accent" attributed by Berlioz to the bass clarinet is not commonly associated with the bassoon; and while this instrument has been called upon in the music of M. d'Indy's *Wallenstein* Trilogy to echo the voice of an importunate priest, it is usually described as the buffoon of the orchestra. This description is not, however, a particularly happy one, for although the curious tone-quality of the bassoon has something of the comic, it does not suggest the intentionally comic. Griboyedov speaks of its sounds as those of a man who is being throttled; but if there is any whose risible faculties would be excited by what his ear tells him about the process of strangulation, none would suppose the half-articulate victim to be willingly, and much less deliberately, mirth-provoking.

The Bassoon really owes its reputation for clowning to composers, who, having recognised its value as an instrument by which chords can be immensely enriched, discovered that when obliged to become melodic the bassoon sounds peculiarly droll; but one can well imagine that if the bassoon have a soul, and this no lover of the orchestra will deny to any any of its essential instruments, this function of the jester which has been thrust upon it must cause it no small amount of heart-burning. A glance at the bassoon player—invariably belonging to the modest and retiring type, and, like his instrument, seeming to shun the publicity into which he is sometimes forced—will support the theory that the bassoon is no willing zany.

Possibly its unwieldy appearance will explain the readiness of the average listener to accept the conventional description. The bassoon is a long tube of wood, having a conical bore, in all, about 9 ft. in length, but in order to make its manipulation possible it is reduced, by doubling back part of the tube, to some 4 ft. Thanks to this expedient the breath can be introduced, as in the other wood instruments, at its extreme end; the bassoon, which has a double reed, and is often called the bass of the oboe, is blown through a longish curved pipe of brass, termed the "crook," which enters the tube at the end of this doubled part, or "wing," which reaches back to a point about one third of the length of the instrument away from the bell. The bassoon is held across the body of the player in a slanting position ; the bell points upwards and outwards towards the player's left, while the lower part rests against the right side of the right thigh. Fingering is approximately the same as in the oboe, and the sound-producing principle is again that of increasing its normal scale by overblowing.

The bassoon, although to sight a ponderous instrument, is by no means lacking in tonal flexibility ; it is capable of a fairish speed and can move about its compass in leaps which have gone a long way towards earning its reputation for grotesqueness.

The DOUBLE, or CONTRA-BASSOON, is the bass relation of the instrument just described. It is much less flexible, and has practically no melodic value, partly owing to the large amount of breath required to set the vibrations of its tube in motion, and also because of their slowness—a quality, however, on which rests its usefulness as an extreme bass voice of a harmony or chord.

IV.

THE BRASS INSTRUMENTS.

In dealing with the wind group as a whole, embracing both wood and brass, we have noted that the latter is conditioned differently from the former, the difference being that, whereas a " wood " instrument is able to alter its note by varying the length of its tube, the open tube of a primitive brass instrument is susceptible to changes only by means of modifying the air pressure, and in older days this had to be effected by the player's lips. Just as we write a different letter to represent each of our vowel sounds, the player made a different lip-effort to produce a required note from the harmonic series, or system of partials. The essential difference between wood and brass instruments is that while in the wood we obtain a lower or higher note by a change of length, in the brass we get an alteration in pitch of the whole series of harmonics—the series remaining, however, relatively the same.

But through a succession of contrivances the brass instruments have become emancipated. It was discovered, first of all, that the horn-player, by introducing his hand into the bell of his instrument, could alter the pitch of notes obtainable from the harmonic series to which he was restricted, and in this way secure flattened notes, or, as it were, notes beneath the regular harmonic or partial tones. Prior to this, the instrument had been able only to utter a few notes, which were available for filling in chords or emphasising a particular accent. A melodic passage would have required a number of instruments arranged to fit in with the composer's needs. The position was similar to that which demands the use of more than one clarinet ; but the brass instrument was infinitely poorer since it was not a question of unsatisfactory sounds in a " break," but no sounds at all. With the discovery of the power of the hand, as the lips' ally, the brass instrument reached the position of the clarinet in so far as it could produce an increased number of notes, which notes were not, however, quite satisfactory, since they had a muffled sound. The player could sound a number of notes by this means, but only the natural ones clearly.

Obviously a horn player could not be expected to furnish himself with a whole row of instruments and to manipulate them with a sleight-of-hand, and, incidentally, of lip, only to be attained by a magician, or, with a smaller object, by a conjuror.

The problem was partially solved by the introduction of the "crook," which gave the player control over as many series of harmonics as he had crooks, the latter contrivance putting the instrument into a different key for the time being. But it was not until the inventive mind hit on the plan of making the horn into a row of horns by introducing into its system a number of tube sections which could be added to the tube proper at the player's will simply by manipulating a valve or piston, that the horn attained its present tractableness and flexibility. The forces now brought into play, in addition to the player's lips, are his hand and the additional controlled tube-lengths, making an apparatus which leaves little to be desired, and so long as we wish the horn to be played by human agency we shall no doubt be prepared to accept it in its present degree of efficiency.

The changes referred to above have taken place similarly in the mechanism of the trumpet, in which valves are now also used. In the trombone we have an instrument in which the tube-lengthening and series-altering process is effected by means of its slide, a contrivance the more understandable since it is easily visible to the audience.

V.

The French Horn, unlike the so-called English horn, does not belie its name ; it came to us from France and was, in its primitive days, the horn of an animal, used in the business of hunting another. The first step in what has been termed the emancipation of the horn, which has now, by means of certain mechanical contrivances, become a highly flexible musical medium, was the substitution of the metal instrument for that derived from the protective member of an animal. But the modern variety bears a sufficient resemblance to its earliest ancestor to enable us easily to identify it. The French horn is a long brass tube, curled round, for economy of space, beginning with a cup-shaped mouthpiece and ending in a wide-opened bell. In seeking to identify it, it should be remembered that the bell is held, for concert-room purposes, not upwards, as in the forest, but downwards, for reasons that will presently transpire.

The principle of the horn's note-production, as has been explained, is that of altering the relation of the player's lips to the mouthpiece, hence the partials of its series are obtained; lengthening of the tube does not produce an extra note, but the same series, in a different key. But in the earliest days of the orchestra no attempt was made to vary the tube-length.

The peculiarities of the horn being that its fundamental is not producible, that its second and third partials are difficult and the seventh and eleventh out of tune, it was obliged to begin its "healthy" compass on the fourth partial, producing that and the six succeeding notes, and adding to these by the variations in pitch of any of these notes, which can be effected by inserting the right hand in the bell; it is for this reason that the instrument has been reversed from the old hunting position, with upward bell. As, however, the hand-notes—a semi-tone higher or lower than the "open" or natural notes—are muffled, the activity of the horn was not greatly increased by them. Such was the "natural" horn used by the classic writers of the eighteenth and early nineteenth centuries.

When the horn has been recognised, and its sound as well as its shape identified, it will not seem strange that so beautiful a tone aroused a keen desire among composers that its activities should be broadened.

The first improvement in its condition, the initial step towards enfranchisement was, then, the invention of the "crook," an additional piece of tube of this shape U, which could be inserted in the instrument, thus altering its length and the pitch of its series of partials. It will be obvious both that the use of one crook must make available a double set of notes—the notes of the natural horn and those of the same series repeated in a different key owing to the additional or crook-length of the tube—and that for the insertion of this crook the composer would have to allow time, and must, therefore, write his music accordingly.

From the somewhat halting affair which the horn had become since the introduction of its various crooks, which could produce its series of seven partials in as many pitches as the player had crooks, the horn progressed to its present mobile condition. This step was brought about by the use of valves, or three extra pieces of tube, each of different length, all permanently joined to the tube of the instrument, but being separable from it by means of three pistons. The extra lengths may be added, therefore, separately, or in combination one with the other. Hence, pressing down two valve-pistons together adds a different length and a different pitch of the series from that obtained by depressing one of the two with a third, and, as a result, a different version of the pitch of the natural series of notes. It should be clearly understood that the series remains the same in the relationship of its notes one to another. If, instead of the actual notes of the horn in C, which are C D E C D E G, we think of the series as a number of flowers whose respective natural colours may be changed simultaneously by the casting of a strong light upon them—the light being projected through a piece of coloured glass, causing each flower to alter in colour, though remaining the same flower—we shall obtain a notion of what the crook or valve can and does effect. The crook is the equivalent of the coloured glass and the light shining through it. The flowers or notes alter their colour or pitch, but the bottom C, or Rose, is just as different in shape from higher E, or Lily, as when seen in the first instance or pitch.

The up-to-date French horn has, then, all the power of alteration in range of compass given it by the use of crooks, but this power is now acquired at a moment's notice merely by pressing down one, two or three fingers, and the player retains the ability to produce further variations of pitch, when necessary, by use of his hand in the bell.

To the horn, however, remains still one striking disability, which has not been removed by the increase of its range, namely, that the production of the seven different notes in the series of partials involves seven different lip-efforts, and, furthermore, the kind of effort required to produce the horn's high notes is so different from that which brings forth its low ones that a player has to accustom himself either to one or the other; horns are used therefore in pairs, one player taking upper and the other lower notes.

The tone of the French horn, which is produced at the cost of so much human ingenuity and effort, is well worth the trouble. It has great variety in quality and a wide range of power. One of its characteristic effects is that produced by the mute, which causes the instrument to sound as though at a distance. This is a pear-shaped contrivance inserted in the bell.

As a "singing" instrument it is hardly surpassable; it may be said to combine the "epic" quality attributed to the clarinet with the subjective or personal expression of the 'cello. When played at its loudest the horn may be capable of terrifying, when its voice is heard in stopped notes it is no longer either the conquering hero or the blustering tyrant, but the sinister villain whose craftiness is no less dreadful. And softly blown, its tones are as dreamy or as insinuating as the flute in its lower register.

The inexperienced concert-goer, having learned that the TRUMPET is to be the next object of his attention, will probably assume that he will have no difficulty in picking out this instrument, imagining it to bear some resemblance to the cornet, which he has seen either in military bands or at street corners, or when hurrying past a public-house whose patrons are being serenaded from a point conveniently adjacent to its swinging door.

But he is advised to look for something different from the cornet, for that instrument is not the same as, but is really the rich and somewhat vulgar relation of the trumpet, coming by its musical effects with ease, and proclaiming its possession of them in a fashion rather ostentatious and self-complacent. The cornet really has the appearance of vulgarity, especially when compared with the slenderer-proportioned trumpet, which, having at length come by its worldly comforts—in the shape of valves, acquired in a process of evolution similar to that of the horn—wears them with the air of one who values the refinements of existence they secure.

Having this outward resemblance to the cornet, and its position in the relation to the player being the same, the TRUMPET possesses kinship with the horn in so far as concerns its note-producing system. Its tube being only half as long, the pitch of the trumpet is an octave higher than that of the horn, but the series of partials available is, apart from considerations of pitch, the same. The principle upon which it is played has gone through virtually the same modifications, and the trumpet, which has tried one more contrivance than the horn—the slide, similar to that of the trombone—is, in its mechanism, now at the stage at which that of the horn has arrived, and its valve is the means by which a variation of the different partials, selected by lip-tensions, is secured. The trumpet is, however, deprived of the hand-notes of the horn, which are not to be satisfactorily sounded, but the mute is very effectively used.

The sound of the trumpet will not be difficult to discern, when blown with full force, for its strident note can be heard in sharp relief from the rest of the orchestra. But it should also be sought in moments other than those in which, to quote Berlioz, "it lends itself to the expression of all energetic, lofty and grand sentiments. . . ." It is capable of gentler accents, and is at times to be heard uttering a note of grave judgment or of consolation.

The trumpet has, like the clarinet and other wood instruments, one or two variants, but neither the alto nor the bass trumpet (the latter is similar in pitch to the horn) has yet been accepted as a regular orchestral medium.

The average man, when he sees the crank of a locomotive, knows that its function is to receive energy from a piston and to transmit it to a wheel. But never having inquired into the working of the slide of a TROMBONE, he probably imagines that the telescopic manœuvres of the player are governed by ordinary considerations of pitch. When he begins, therefore, to concentrate his attention upon the method of tone-production in a trombone, he will notice very soon that, whereas the full extension of the player's arm will result in a note of a certain pitch, an adjacent note will not necessarily be obtainable by slightly varying the length of the slide.

The reader who, it is presumed, will hardly need a further description of the outward appearance of the trombone, already possesses a knowledge of the principles governing the production of musical sound from a string or tube. He will be able, therefore, to divine that the tube of a trombone is capable of uttering, by means of vibrations set up by air-pressure, a series of notes comprising a system of partials, and also that the lengthening or shortening of the tube by drawing out (or in) the slide will result in a variation of this series as to pitch; he will know that a particular partial in any given series, irrespective of the pitch at which the series happens to be fixed, is obtained by a particular lip-tension, and that as the harmonic series is not a scale, but much more like an arpeggio, the trombone player may frequently have to move from one slide-position to a distant position in order to find a note which, as recorded by the listener's ear, is a neighbour of the preceding note. He will, therefore, have little difficulty in realising that the fundamental difference between an instrument of the valve type, like the horn and the trombone, is that, whereas the valve is of definite length, the slide can be placed in any position, and can vary its length in any degree within its limits at the will of the player. The trombone player's execution therefore resembles that of the fiddler's left hand so far as concerns the shifting from one position to another, as, in addition to the variation in lip-tension required for the selection of a note from the harmonic series, the trombonist has to judge the distance that his slide must travel in order to place a certain partial in a certain position or pitch at the disposal of his lips. The trombone resembles the violin more, however, and differs more from other wind instruments, in that it has absolute control over pitch, and is therefore to be regarded as a singularly flexible symphonic vehicle.

In the popular imagination the trombone is credited with a vulgar tone, in which the element of " blare " predominates ; in reality, the trombone is even less the vulgarian of the orchestra than is the bassoon the jester. The instrument happens to possess a capacity for comic effect, and this has been exploited in the concert as well as in the " variety " hall, but, employed by composers who desire to seek the beauty which a given instrument can provide, rather than the oddness of effect to be obtained from it, the trombone reveals a beauty of tone that does not yield even to the splendidly-endowed French horn. Because of its freedom from the disabilities affecting other wind instruments, the trombone has been entrusted with the responsibility of forming an orchestral choir, or family of its own species. We shall observe that in this there are two tenor trombones and a bass—the latter being larger in build and requiring a handle to its slide to enable the player to extend it at full length. These three instruments are capable of excellent melodic as well as harmonic effects; in the latter they are joined with remarkably beautiful results by the bass of the group—the Tuba.

The Tuba, though classed, or at any rate grouped, with the trombones, has no resemblance whatever to the latter in point of appearance. As to dimensions, it is the giant of the orchestra, its mighty brass bell sprouting up from a complicated maze of tubing, in which the three pistons form the best-defined and most regular feature, might well be expected to emit sounds in which the whole orchestral tone would be engulfed; but the comparatively narrow tube, ending in the cup-shaped mouthpiece through which the breath is introduced, suggests a means of control which, in fact, it gives to the player, and when the tone of the tuba has been, as it were, isolated, it will quickly prove to be a by no means unsensitive instrument, and one which has a goodly share of flexibility. Its function is not always that of contributing to a "blare," for, in addition to its power of adding a gentle note to a soft chord produced by the horn family, it is able to provide its somewhat ponderous version of a melody which has been played by instruments of a lighter calibre. A comparison of the utterance of the tuba in Tchaikovsky's Pathetic Symphony, where it is called upon to assist in voicing the final expression of a tormented soul, and in Wagner's *Rienzi* Overture, in which its deep and full-throated sound provides an appropriate foundation for the majestic brass chords of the march refrain, will excellently reveal the wideness of its tonal and expressive scope.

As to its tone-quality, it should suffice to refer to it as the double-bass of the brass group—a description which should render its identification a simple matter.

VI.

THE PERCUSSION INSTRUMENTS.

The third of the three main, or basic groups of the orchestra is called the Percussion group, a name which may be said forcibly to describe the function of the instruments therein, for they are one and all made to sound as the result of the sudden contact of one body or substance with another. It should be observed, however, that the contact in such instruments as the cymbals and the tambourine is akin rather to a kiss than a blow.

Subdivision of the Percussion Group is better made with reference to the sound produced than in consideration of the manner or power of the impact. The instruments will then prove to be of two kinds : the variety in which pitch is a consideration and those in which that consideration does not enter.

The principal member of the first class is the Kettle Drum, which belongs also to a secondary category of percussion instruments constituted by those whose tone is emitted from an elastic surface or stretched membrane as distinct from those in which the sound emanates from the vibration of a metallic substance.

In dealing with the various bowed and wind instruments of the orchestra, attention has in each case been called to the outward physical appearance of the instrument in question, in order that the reader should be provided with as simple a means of identification as possible.

The inexperienced will be inclined to suppose that in regard to the Drum no such precaution should be necessary. But anyone who has hitherto been content with the kind of music designed for that those who hear may march, are asked to understand that the drum of indoor usage is of three kinds and that the most important, the Kettle Drum, is the least familiar, despite its appellation, in outward aspect. In the standard, or classical works, those written during the period leading up to Beethoven, we find two kettle-drums in use, and it should be remembered, therefore, that the drummer is placed in a position somewhat similar to the clarinettist, having more than one instrument at his disposal. In the modern orchestra we shall see three, and sometimes four, kettle-drums. Berlioz, in his monster *Requiem*, employed eight pairs, presided over by ten players.

The kettle-drums will be found at the back of the orchestra, usually in the middle. The instrument has not the spout suggested by the adjectival part of its nomenclature, and is, in shape, more like a basin than a kettle; as it rests on a metal tripod, the student who seeks an acquaintance with it will do better to expect something more resembling a monstrous camp-washstand than a kitchen utensil. The basin is made of copper or brass, and, if seen from a high elevation, will appear to be full. This illusion is produced by the parchment, its sound-producing medium, which is stretched over a ring fixed inside the basin at the top, and its tension is controlled by a series of screws fixed to the outside rim of the basin.

Hence, even when only two drums were used, the notes producible were not necessarily fixed, as, by varying the tension of his parchments, the player could tune his two notes to the key required in a given piece by the composer.

The two notes in question were almost invariably the tonic, or key-note of the key, and its dominant beneath, a fourth lower. With Beethoven, however, came the emancipation of the kettle-drum, which then found itself elevated, as Mr. Forsyth * suggests, from the culinary to the celestial region, although we should here perhaps vary the metaphor and refer to its translation from the cubicle to the drawing-room, undergoing a transformation rendered familiar by the antique furniture craze. Beethoven it was who introduced such novel tunings as the drum-couple in octaves and diminished fifths, and the sounding of two notes simultaneously, while Meyerbeer, by means of four drums, contrives to obtain a melody from the combination in his *Robert the Devil.*

The vibrations of the parchment or " head " of the drum are set in motion by sticks made of malacca, with a head of felt. The methods of striking are various and the range of power virtually illimitable ; the drum can emit a sound soft as the purr of a satisfied animal, but on occasion its tone is that of thunder, and in Tchaikovsky's fifth symphony it is given a note which sounds as though a score of devils had suddenly been clapped under the lid of a cauldron.

The other members of the drum family are instruments having no pitch significance. These are the BASS-DRUM and the SIDE-DRUM. The first requires no description beyond a statement that it is the big drum of common parlance. It is used chiefly for rhythmic purposes, but at times contributes to the production of a maximum of noise. The Side-drum is also familiar, since it resembles the kind used in the nursery. It is the smallest, but ought to be considered by no means the least, for it has a variety of effects exceeding those of its more highly-developed brother the kettle-drum.

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* *Orchestration.* Macmillan & Co. and Stainer & Bell.

Its most familiar form of utterance is the roll, which may have the loud and aggressive sound as of rapidly reiterated explosions or a soft patter recalling rain-drops. In the production of this lies the technical difficulty of the instrument, but the effect is artificially enhanced by a device called the "snare," which assists the player without revealing its presence to the listener. This consists of a set of catgut strings laid across the lower or bottom parchment, upon which they rattle. They are controlled by screws.

Of the two important percussion instruments of a melodic kind used in the orchestra, the GLOCKENSPIEL and the CELESTA, the former is the more commonly used.

The name glockenspiel is of German origin, but the instrument itself appears to have been made in imitation of Flemish chimes. British musical terminologists will no doubt be ready to accept Mr. Forsyth's hint that the name originally employed here for this instrument should be revived, although that authority did not himself act upon it. The present writer intends to do so, making, however, a modification. The Bell Chime now in use has a sound resembling a bell, but it is derived from steel plates made to vibrate by hammers of wood with which the player taps them. The resultant sound is a silvery, tinkling note, which is exceedingly effective in suggesting the elf-like in descriptive music. Its tone will easily be identified, as the bell-chime stands out sharply from any orchestral combination of which it may form part.

The Celesta has been made familiar by its use in Tchaikovsky's popular *Nutcracker* Suite, in which it was first used, the composer having been told about the instrument by its maker, M. Mustel, of Paris. Tchaikovsky appears to have been desperately afraid that someone else would hear of it and hastened to secure its association with his name. In appearance the Celesta is like a miniature piano, but, instead of strings, plates of steel struck by hammers provide its tone. It is not, however, played directly, like the bell-chime, but has a keyboard similar to that of the piano. Its tone quality is best described as that of a piano with peculiarly delicate yet resonant notes.

The instruments in ordinary use having no pitch quality are the Triangle, the Cymbals, the Tambourine, and Castanets.

The shape of the Triangle needs no description, and its note is surely well known to all.

As this instrument is held well in front of the player, the method of striking it with a small stick of steel is easily discerned and remembered. Its sound is penetrating, and well adapted for the purpose of lending a kind of ornamental emphasis to the rhythm. Sometimes, however, the triangle is honoured with a solo passage. The indentification of the CYMBALS will depend on circumstances. These two discs of metal are so often used simultaneously with the bass drum that it has been found convenient to attach one of the plates to the top of the drum, and the player is then able to manipulate the upper plate with one hand and the drumstick with the other. In this position the cymbals are not so easily visible to the listener as they are audible. But they are frequently used apart, and in this case the plates, which have a hollowed-out centre, are held by the two hands, a strap being provided at the back for this purpose. The ordinary method of use is to strike these plates across each other—a movement which produces, as it were, concussion tempered by friction. Other methods are employed according to the kind of effect required, such as the use of a drumstick on a single plate.

The TAMBOURINE and CASTANETS are instruments usually included in an orchestral piece with a view to obtaining special and sometimes "local" colour. The tambourine is either struck, like a miniature drum, which has hardly any resonance, in which case the small cymbals with which it is surrounded add their jingle to the sharp sound of the "head," or is shaken, when the parchment is, of course, dumb, only the jingle being heard.

The CASTANETS are usually reserved to music which happens to refer either to Spain or Morocco. They are two small pieces of hard wood, held by fingers and thumb, and clapped together to establish the rhythmic character of a dance.

VII.

THE HARP.

The HARP is not to be considered a regular member of the orchestra since it was not used by the classical symphonists. But as, owing to a number of improvements, its qualities as an orchestral instrument, as well as its popularity, have been greatly increased, and as, also, its mechanism is quite distinct from that of any instrument already herein described, the harp is given a place outside groups and categories.

Description of the harp for identification purposes is, of course, unnecessary. It may be emphasised that, were its shape unfamiliar, it would, until lately, have been easily picked out, partly because of its prominent position in the forefront of the orchestra and partly because the lady harp-player has for generations maintained, as it were, a right of way for women in the orchestra. Apparently the whole estate has now been made public to the sex.

The emancipation of the instrument itself has been somewhat similar to that of the brass horn and trumpet. Originally it had a set of strings, each producing one note, and its sphere of action was more or less limited. The introduction by Erard, about a hundred years ago, of a pedal control, consisting of seven pedals by which the strings are shortened in two degrees, resulting in a rise of a half or whole tone, has immensely increased the radius of the harp's action, and it is now able to produce combinations of notes which were formerly impossible. The changing of string-lengths is effected by depressing the pedals into one of two slots—a controlling mechanism resembling in a general way the " gate change " of a motor-car gear apparatus.

The harp is capable of effects other than that of the arpeggios in close and open formation, which derive their name from the instrument's. Of these, three may be mentioned. Harmonics are produced much in the same way as on the violin, the harp-string being stopped at one point by the flesh-pad at the root of the thumb, and plucked with thumb or finger ; the sound is quite unlike anything else heard from the orchestra. Homophones, or the simultaneous double-sounding of one note on two strings, are rendered possible by the pedal tuning system, which raises a given string to the pitch of another, thus securing two strings of identical pitch. The glissando, produced by drawing the finger across the whole range of strings, is used to obtain effects such as that of a whirlwind, sometimes meteorological, but on occasion mental.

Harps are often to be found in pairs.

CHAPTER V.

THE COLLECTIVE ORCHESTRA.

I.

The orchestra, as a collective body, is to be thought of primarily as a means whereby the composer is enabled to express his musical thoughts. It is obvious, of course, that many of its units could be made to serve in this capacity individually. The difference is this. In writing music for a single instrument the means of expression is comparatively limited, and in such circumstances the composer is, as it were, communicating his thoughts through a vehicle which, though permitting a clear and concise expression of his meaning, affords him no considerable scope for playing upon the emotional sensibilities of his audience ; he may be eloquent ; his words may be well chosen and his phrases well ordered, but his discourse is like a narrative or disquisition which depends largely upon a sustained excellence of diction for its effect. If the narrative be thrilling, or the thesis striking, its effect will maintain a grip upon the listener, provided always that the speaker maintains a consistent quality of delivery. But if either of these fails, there is naught else to hold the listener's attention pending a revival of his interest.

II.

When writing for orchestra, however, a composer is placed in a much more favourable position. The orchestra possesses so many different voices, and places such a variety of contrasts at the composer's command that he may well be carried away, and, beginning a discourse upon a particular subject, he may be inspired to reveal his whole life's philosophy; moreover, the very variety of instrumental voices renders the orchestra capable of uttering an infinite number of shades of opinion—a point of argument may, as it were, be canvassed or discussed so that every shade of opinion is elicited; the difference between an orchestra and a single instrument may therefore also be compared to that between the narration of a significant episode or occurrence and a rehearsal or reconstitution of the episode: the individual instrument is a narrator; the orchestra, on the other hand, is able to enact or re-enact a tragedy or comedy: in short, the single instrument bears the same relation towards the orchestra as does the platform to the stage. And if we accept this analogy, we may maintain the metaphor it places at our disposal and proceed to contend that, while on the platform, our narrator depends entirely on his oratorical powers and his talent in suggesting the presence of the protagonists and the occurrence of the situations of his narrative, and that while the stage presentment gives a much more vivid account because of the *actual* presence of these protagonists, we have not yet reached the summit of effectiveness until we introduce the scenic element. When this is added, the reality of the drama is clearly enhanced in a tremendous degree, and we then begin to forget that we are an audience, imagining ourselves spectators.

III.

It is as a fully furnished stage that the orchestra serves the composer, and even if the drama be a poor one, the charm of the scenery and the presence of its actors will succeed in holding an audience's attention much longer than a mere narration. The orchestra gives, in fact, to the composer the power to be so captivating in manner that the quality of his creative material will be disguised. Music that sounds uninteresting on a piano may be invested with an intense power of fascination by the manner in which it is distributed among the orchestral instruments. This distribution, when considered in relation to the orchestra as a body, is called scoring, or orchestration; in its relation towards the individual it is termed instrumentation.

Of the intelligent listener it is required that when listening to an orchestra he shall, as it were, accompany the composer through the process of orchestration. The uninitiated cannot possibly understand how much is added to the pleasure of listening when one is able to appreciate the dexterity with which the orchestra has been handled, with which a passage has been made to sound beautiful in spite of those obstacles which the handling of wind instruments must from time to time present.

IV.

The manner of orchestration reveals to us the temperament of the composer, the quality of his humour, and in some respects the calibre of his mentality. If, for instance, at an early stage in the composition to which we are listening, he allots a sentimental passage to the instrument which is capable, above all others, of giving a full expression to the emotional content of the passage, we shall almost instinctively feel that we are listening to one who is inclined to wear his heart on his sleeve; we shall probably receive an impression similar to that conveyed to us by a person who confides in us at so early a stage of our acquaintance with him that we are persuaded that he cannot possibly yet know whether we are fitted to receive such a confidence. One composer may appear to emphasise the obvious by using an entirely conventional combination of instruments, just as may a person during conversation. The difference between one who ploughs his way stolidly through such an assertion as "I often feel persuaded that the proverb which assures us that 'too many cooks may spoil the broth' contains more than a modicum of truth," and another who deftly flashes a light upon his own thoughts with a " 'too many cooks,' you know," represents a wide disparity of temperament, and no less a disparity may be revealed to us in comparing the manner of orchestrating adopted by two different composers. It need hardly be said that the faculty of such comparison becomes, after a time, second nature in the listener, and the sympathy or aversion aroused forms an integral part of our appreciation of, or dissatisfaction with the piece and its composer.

V.

In what does the system of orchestration consist? What has the composer to consider, and how does he proceed in face of the several groups and variety of instrumental units which the collective orchestra presents? We know that he will begin by dividing his orchestra into the three groups or categories of melodic, harmonic and percussive or rhythmic, but we begin to suspect that melody is not the exclusive privilege of the bowed instruments, for even the kettle-drum may on occasion be asked to participate, and, furthermore, that the "strings" can be well relied upon to furnish harmonic substance what time the wind is exercising a melodic function.

The orchestra provides the composer with a means of adding to the qualities of his melody and harmony, such as they may be, beauty of tone, wide variations in tone-power, contrasts in harmonic colour and in the tone of melodic phrases when given out by different instruments in succession. Orchestration consists in discovering and seizing the ideal presentation of melody and harmony in a distributed form. The composer, as orchestrator, seeks first of all to set his composition correctly, *i.e.*, to employ the right groups or the right instruments at the right time. It is self-evident—to take an extreme example—that if he gives his melody to one solo-violin, playing, moreover, on its lower strings, and to the combined brass a broad and powerful series of loud chords as accompaniment, the melody will be inaudible, and we are able to assure ourselves that, apart from such extreme examples, there must be many occasions on which the ablest orchestrator may err in judgment, and that on hearing the result of his labours he may often feel inclined to alter the plan in certain particulars.

But in addition to the question of correctness there is also the question of style and individual taste to be taken into consideration. It will be easily understood that a genius will, either by the dexterous employment of the conventional orchestra, or the addition of some newly-invented instrument, be able to create a new tonal effect in his orchestral version.

VI.

The listener who is fairly experienced will be able to identify the units of a conventionally orchestrated passage as easily as he will succeed in discerning the ingredients, if eating blindfold, of a mouthful of roast beef judiciously smeared with mustard. But if he listen to the work of a modern pioneer of orchestration he may oft-times be pleased by what he hears and at the same time be puzzled, and when he succeeds in discerning the identity of the instruments or groups employed, he may conceivably be astonished at the beauty of an effect which might, had he seen it on paper, have seemed certain to prove incongruous. Everyone knows the taste of chickens and of greengages, but they usually pass over the palate separated by a considerable interval; singularly few are aware how deliciously they blend when tasted together. The discovery of a Berlioz, a Tchaikovsky or an Elgar finds its analogy in that of a Brillat-Savarin, an Abraham Hayward, or a Newnham Davis.

The composer has first of all to consider the primary or essential factors of correct orchestration in order that no part of the mosaic of sounds represented in his score shall be overbalanced or dimmed by the unduly high colouring of any particular part. He is, of course, familiar with the conventional groupings of instruments which have obtained sanction after experiment by a long line of precursors. He will know, for instance, that the wood-wind is available as a " buffer state," that this body, when added to the strings, serves to soften their edge, and that when, on the contrary, they join the brass, they have a sufficiency of strident tone in excess of that of such brass instruments, as, for instance, the horn, to introduce a penetrating quality into a tone that might otherwise be too subdued.

He will be cognisant also of the practice of supplementing a second type of instrument when a melody has been allotted to a first as principal. Giving a melody to his flutes he will, on occasion, call in the aid either of oboes, clarinets or bassoons, which will either join the flutes on the same notes of the melody or re-inforce them at a distance by playing at an octave, or, at times, two octaves, below. The wood wind instruments may, of course, be supported also by brass, in accordance with the requirements of the situation.

VII.

It will be self-evident, even to the tyro, that among the various instruments of the orchestra no two are of uniform strength of tone, and if he recall the principles in accordance with which they produce their sounds, it will be readily understood that there is as great a divergence in quality as in quantity of tone. This applies particularly to the wind instruments, for the strings, so far as quality is concerned, approach far more closely to uniformity.

It is for this reason that when two or more instruments of different tone-power and calibre are employed simultaneously it is the practice of composers to arrange for a judicious combination. In the classical orchestra, in which far less strings were employed than nowadays, this did not call for so great an effort as has been necessary since the orchestral body has been increased. With this increase it has become imperative to add to the approved groupings of wind instruments in pairs ; pairs have given way to threes, fours and fives in order that the composer may have sufficient reserve to obtain a proper balance at all points. Within this method of balance there is also that constituted by directing the more full-bodied and penetrating instruments to play with less force ; the examination of a score will reveal that in a loud passage the strong-toned instruments receive directions couched, as it were, in comparatives, so that the cries of the weaker may not pass unheeded.

VIII.

Not the least fascinating method of orchestral writing, and one which affords, perhaps, the greatest help to the raw listener, is that which may be described as the episodic dialogue, or conversation. From time to time the concert-goer will hear (somewhat frequently in the symphonic works of Beethoven) a melodic fragment taken first by one instrument and then by another, each in turn impressing it with a reflection of a separate individuality; in this, moreover, we have an example of the power of manner over material, for even if the melodic fragment be a mere commonplace, it will gain a considerable interest from the divergence in the articulation of the several instruments uttering it. As has been implied, the passage of a motive or theme across the orchestra should be anxiously awaited by the student of symphonic ways and means, for this will provide him with the best possible chance of identifying the various tone-qualities or timbres of the numerous orchestral units.

IX.

The reader will probably here ask the question: " How are we to identify the various instruments? We may succeed in isolating them by reference to a description of their shape, but how is the identity of an instrument to be guessed from its tone? "

The answer to this is that, as a very small proportion of the orchestral instruments have been given a suggestive or onomatopœic name, it will be impossible, without foreknowledge, to make sure from what instrument a certain tone-quality is proceeding, unless the listener has provided himself with the score; this is a convenient and often an inexpensive kind of "key" to the orchestral picture, and will prove a fairly easy means of registering the instrumental contributions to the whole mass of sound. In calling it a fairly easy means one bears in mind that, before he can read a score, the student must get on terms with the method of writing such a record of orchestral occurrences, and the uninitiated person who tries to piece together the harmonies of a page from a symphony without first obtaining a hint as to this method, will produce some odd results. We shall now, therefore, proceed to explain what score-writing entails, and what score-reading demands.

CHAPTER VI.

THE SCORE.

I.

THE Score serves several purposes. In the old days, before the era of the conductor, when the first violinist was really the leader of the orchestra, and, when occasion demanded, would conduct his colleagues through any passage in which a modification in *tempo* occurred by beating time with his bow, the score, compiled by the composer, was simply a record of the music in its orchestral version, and, once the separate parts had been copied from it, was only required in an emergency. With the advent of the conductor, however, it became customary to print and publish the score, and, in more recent times, the listener has been indulged with the provision of a means of studying and following the music from a miniature or pocket reproduction. Modern scores of works in which the instrumental body is very large are reproduced by photography—a comparatively inexpensive process.

The score, at a first glance, seems a simple affair enough, but at a second the student will see that as some of the instruments play, or rather sound, notes different from those written, score-reading, following, and especially playing, cannot be successfully undertaken without special knowledge, and, after that has been acquired, some practice.

This difficulty is caused by the principle of transposition, on which certain instruments are played and written for.

An examination of a score-page will disclose that, while in the strings the key-signature is that of the key in which we know the piece to be, some of the wind-instruments have other key-signatures. If we were to reproduce on the piano the notes we find in the score, the chord chosen would not have the sound we had heard when the piece was performed on the orchestra. There is a story told of Dvorak, that when a youth, he arranged some music for a band, and being in ignorance of the necessity of transposing, wrote a trumpet part in the key of the piece ; as this occasion was intended to be something in the nature of a demonstration of his musical prowess before the parents to whom he had recently returned from school, one can well imagine his dismay at this revelation of the dangers arising out of insufficient knowledge !

II.

The reason for the variations of key-signature in a score is easily comprehended once the principles of sound-production are understood.

The reader will remember that the principles in accordance with which the wind instrument produces its sound are founded upon the natural harmonic system, *i.e.*, that when the air in a tube is set in motion, the vibration of the air-column takes place in segments and that the division of these segments results in the production of partial tones. The incidence of this system is perhaps best explained by a kind of comparative instrumental anatomy.

If we turn to the clarinet, which is a transposing instrument, we find that it is built in a certain key, and that a change of note is effected by an alteration of the length of the air-column —an effect produced by opening up holes in the side of the instrument—the higher octaves being secured by graded over-blowing, which brings into play a different fundamental, and, consequently, a different set of partials. It will be remembered that owing to the " break " in the clarinet compass—the section in which the instrument is tonally unsatisfactory—it has been found expedient to employ instruments of different calibre, so that the notes which in a clarinet of one pitch would be unsatisfactory are played on another on which these particular notes do not occur in the " break," but in another section of its compass, being therefore satisfactory.

Transferring our attention to the horns, we discover that these instruments are likewise built in a certain key, and that if played in this normal key they produce their series of partials by variation of lip-tension ; further, that the whole series is altered by the use of a valve which lengthens the tube, so that when a note not to be found in the natural series is required, it is secured by changing the calibre of the instrument, and, in consequence, its partials.

III.

Now if we consider the violin, and imagine that the player is only allowed the harmonic or partial notes of one string, we shall at once perceive that his left hand will often be obliged to make wide leaps from one spot to another in order to produce a scale selected from his partial notes; or, if we use the piano for our comparison, we are under the necessity of imagining that all notes save the harmonic series have been eliminated from the keyboard and that the player, if he wish to play a scale, must pick out the partials, not in their order of occurrence on the keyboard, but in another. Moreover, unless he contrive, he will obtain only a limited number of notes, either on the violin or the piano of our hypothesis. What the wind-instrumentalist contrives is in reality the equivalent of what the violinist would be obliged to do in such a situation: he would alter his string, whenever he required a note not in the natural series, by screwing it either up or down, thus changing the pitch and throwing open a new set of partials; the pianist would probably depend on an equivalent device by which he would lower or raise by means of a mechanical process easily manipulated.

In instruments such as the clarinet, which has a cylindrical bore, the fingering is more difficult, owing partly to the absence of even-numbered partials. It is necessary therefore to keep the fingering as nearly as possible uniform, and, when the orchestra has to play in a key which is difficult for the clarinet, to arrange that the latter shall *finger* in the easiest possible key.

If, then, the clarinettist is using, say, his B flat instrument, he will in any case be sounding notes a whole tone below the notes written in his part and in the score, and, in addition, the composer writes for the instrument in the key which will make the clarinet part as easy as is possible in the circumstances.

Thus the clarinettist is placed in the position of our hypothetical violinist or pianist, in that whereas he will on occasion alter the pitch of his instrument, just as does the horn player, the fingering system is kept as nearly as possible constant.

If his part were written as it sounds, the instrumentalist would have to do the transposing, which would be, so to speak, a physical as well as a mental transposition; the conductor's or reader's process is only mental. To explain the matter in the briefest possible fashion, the notes written for transposing instruments are construed by the player as fingering indications.*

It should be here pointed out that there is really no need for the score to be identical with the part played by the instrumentalist, and a few attempts have been made, without any considerable success, to abolish this old-fashioned and unnecessary method of score compilation and to introduce the practice of giving the parts of transposing instruments as they sound.

Until this reform obtains full sanction the score-reader will be obliged, when perusing a masterpiece in his arm-chair, to perform a feat which appears to be comparable to that of reading a play in which the chorus or crowd speaks in the vernacular and some of the protagonists in certain other languages. To the accomplished linguist the sense of the play will be revealed, but the commencing polyglot will secure but a spasmodic appreciation of the drama.

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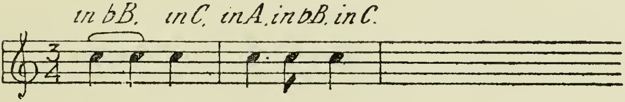
* An excellent illustration of the principle of transposition is afforded by an example given by Mr. Forsyth, who renders the first two bars of our National Anthem, as played by a series of transposing instruments, thus :—



IV.

The transposing instruments in ordinary use are as follows:

The English Horn, which has the same fingering-system as the Oboe, but which, owing to its greater length, sounds a fifth lower; its part is written, therefore, a fifth higher, and its key signature has one more sharp than the key of the piece.

The Clarinets in B flat and A. In the first, the note B flat is the equivalent of C. In consequence of this the B flat Clarinet part will be found to have discarded two of the flats belonging to the key of the piece, thereby effecting the necessary transposition from B flat (two flats) to C (none). As an instance of this, music for the B flat Clarinet which, for a non-transposing instrument, would be in the key of A flat (four flats) is written for the B flat Clarinet in B flat (two flats). The same subtraction obtains, naturally, when there are sharps instead of flats. Two sharps *more* being the equivalent of two flats *less*, the key of C would become, for the B flat instrument, that of D (two sharps).

The same condition of affairs prevails with the A Clarinet. To alter the key of A so that it would operate as that of C means the discarding of three sharps; hence, whilst music in A would be written for this instrument in C (or three sharps less), music in B (five sharps) would, in process of dropping three sharps, become music in D (two sharps) and music in D (two sharps) would drop its two accustomed sharps and one flat into the bargain—appearing, therefore, as in F (one flat).

The Bass Clarinet, usually in B flat, in addition to the transposition, is written an octave above, in order to avoid leger lines.

The Horn is written for according to the fingering system best suited to the key of the piece. Obviously the F Horn will have its notes written a fifth higher than the notes sound.

The Trumpet undergoes transposition similar to that of the Clarinet, its fingering system being usually either B flat or A.

The Piccolo and the Double Bass are not, strictly speaking, transposing instruments; the transposition undergone by the music does not affect the tonic, or key-note; it is, in a sense, a platonic transposition. The Piccolo part is written an octave lower and the Double-Bass part an octave higher than the real sounds in order to avoid leger lines—as already noted in reference to the bass clarinet.

There is no royal road to adeptness in score-reading, but the attainment of facility by means of experience and experiment in the orchestral concert-room will surely be reckoned a pleasure rather than a toil. From our illustrations it will be seen how a standard score is arranged, and the student will observe with some trepidation that the tendency towards increase in size of the orchestra has caused the score to grow until there are often many lines in it which are not to be found in the classical examples. The scores of such works, for instance, as Skryabin's POEM OF ECSTASY, which at moments requires more than thirty-six staves to the page, could hardly be reproduced in pocket size, since that would render the reproduction too small to read. An attempt in this direction has, however, been made with the Strauss work, but, as the page has to be sufficiently high to accommodate the numerous lines in a readable type, the length of lines on each page is of necessity curtailed in order to retain some semblance of pocket dimensions, and hence it becomes necessary to turn over with a frequency that speedily grows irksome. One feels like a Liliputian trying to read the score of a work intended for the edification of Brobdingnag.

* * * * * *

Fortunately there is no reason why the comparison instituted by the inclusion of these examples of scoring should deter the intending student from entering upon a study of the symphonic literature. The history of the orchestra is at the beginning of a new chapter. Bigness as an end, and even as a means, has now, for obvious reasons, very little to recommend it, and the future of the orchestra must lie with those who know full well that simplicity is not incompatible with beauty.

CHAPTER VII.

THE CONDUCTOR.

I.

THE conductor is the vicar of the composer. The composer has compiled his score, but requires the interposition of a temperament between the sounds which are therein represented and the audience, in order that his music, by means of contact with human emotion, shall be invested with the greatest possible emotional significance in its passage from the instrument on which it is reproduced to the listening multitude. The conductor is, therefore, first and foremost, an interpreter.

But his interpretation is not the outcome of a spontaneous rendering of the composer's music. It comprehends a secondary function in the exercise of which he communicates to a body of players pledged to listen respectfully to his advice and to follow his directions, the views he holds regarding the composer's intentions, availing himself of the orchestra's goodwill to carry them out to the best of his ability, and with all the feeling, and also the precision, of which he is capable.

" Have you ever," asks Nietzsche, in a disquisition on Education, " at a musical rehearsal, looked at the strange, shrivelled-up, good-natured species of men who usually form the German orchestra ? . . . What noses and ears, what clumsy, *danse macabre* movements ! Just imagine for a moment that you were deaf, and had never dreamed of the existence of sound or music, and that you were looking upon the orchestra as a company of actors, and trying to enjoy their performance as a drama and nothing more. Undisturbed by that idealising effect of the sound, you could never see enough of the stern, mediæval, wood-cutting, movement of this comical spectacle, this harmonious parody on the *homo sapiens*. Now, on the other hand, assume that your musical sense has returned, and that your ears are opened. Look at the honest conductor at the head of the orchestra, performing his duties in a dull, spiritless fashion : you no longer think of the comical aspect of the whole scene, you listen—but it seems to you that the spirit of tediousness spreads out from the honest conductor over all his companions. Now you see only torpidity and flabbiness, you hear only the trivial, the rhythmically accurate and the melodiously trite. You see the orchestra only as an indifferent, ill-humoured, and even wearisome crowd of players. But set a genius—a real genius—in the midst of this crowd ; and you instantly perceive something almost incredible. It is as if this genius in his lightning transmigration, had entered into these mechanical, lifeless bodies, and as if only one demoniacal eye gleamed forth out of them all. Now look and listen—you can never listen enough ! . . ."

II.

In such a man as the conductor of Nietzsche's vision we have the complement of the composer. But the modern conductor, though often fully conscious of his genius, is apt to forget that that genius ceases to be properly applied directly the composer is forgotten. In accepting the responsibility of expounding the work in hand, the modern conductor is prone to exaggerate his own importance, and to forget that conducting is not in itself an end but a means. That superfluity of gesture, to which M. Jean Marnold refers,* when he opines that " the interposition of an agitated personage between the work of art and the author is ill-calculated to enhance its effect on the auditor . . . " is not the only token of this forgetfulness. The public should remember at the close of a performance that the composer deserves applause since he is often a more important personage even than the conductor. When, therefore, the conductor, having received the audience's congratulations and having acknowledged, as sometimes he does, that without the orchestra his greatness could hardly have been made so apparent, he might well take steps to remind the audience that the composer, also, has his uses.

III.

But let us give the conductor his due. If we are inclined to consider that he is apt to over-estimate his own share in the combined or collective work of composition and interpretation, and that, having made his points clear at the rehearsals which preceded the concert, he is disinclined to figure as nothing more than a prompter whose work has been done at rehearsal, and prefers to emphasise these points for the sake of picturesqueness, putting, as it were, a gilt frame round every indicative gesture, we must remember the immense amount of preparation that a proper rehearsal of a great work, especially if it be unfamiliar to the orchestra, entails. Apart from the duty of securing an accurate performance, accurate in respect of time, rhythm and intonation, and apart also from the process of impressing his personal temperament upon the collective orchestral interpretation, the conductor has often to repair certain shortcomings in the work of the composer.

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* *Musique d'Autrefois et d'aujourd'hui.*

For the composer often writes what can be heard in his mind, but could never be clearly heard in public performance. Part of the conductor's task lies in the revelation of inner voices in the composer's score. We often hear an eminent conductor acclaimed for having "brought out things we never heard before." In reality he is, rather, suppressing the things with which we are familiar and can take for granted, for the benefit of the hitherto unheard. The composer, writing what is in his mind's ear, does not always remember that one voice may easily be drowned by another or others.

It lies with the conductor to do his best for a score in which there are often passages which have for a long period been, as it were, imprisoned.

Again, the rehearsal of a modern work is a much more complicated affair than the preparation of the classic which is written for a comparatively small force. The number of instrumental types is larger, the collective mass of sound is much greater, and instrumental passages are increasingly difficult.

And here we must give the modern orchestra full credit.

IV.

The young genius of Shaw's *Love Among the Artists* reminded a conductor during the rehearsal of his masterpiece, of his suggestion that " some of the parts ought to be given to the men to study before rehearsal." " My dear Sir," retorted the conductor, " I need hardly tell you that players of such standing as the members of the Ancient Orpheus orchestra do not care to have suggestions of that kind offered to them."

All this has been changed, and, since Strauss made a beginning by issuing a number of books for the orchestral instruments, containing all the " unusual " passages to be discovered in his works, the act of practising before rehearsal is no longer regarded by orchestral players as an admission of incompetence, and the orchestra, which used carelessly to pronounce passages not to be played without private study "impossible," now admits that everything written by a composer is intended by him at least to be played, even if not to be heard, and does its best to play all *as written.*

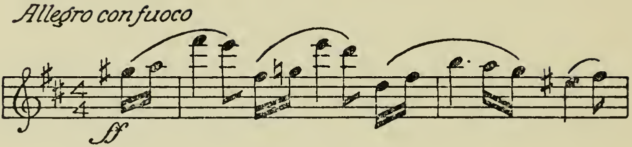
V.

The conductor, then, bears a very great responsibility, for it lies with him not only to prepare the orchestra so that it may efficiently weave that intricate fabric of sound which a modern symphony constitutes, but to interpose his own temperament in its rendering in a manner which does no violence to the apparent intentions of the composer.

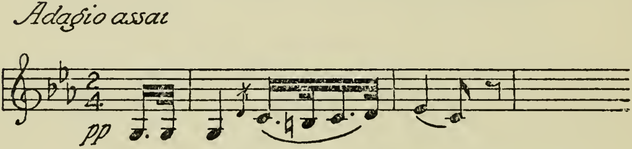
He must, in short, *pace* Carlyle, be a genius *with* an infinite capacity for taking pains.

But it behoves him to remember that he succeeds best in being an artist when, having conscientiously performed all the labours of preparation, he contrives to efface himself sufficiently well that the music put before an audience is treated as the main consideration, and when he remembers that, in undertaking its interpretation, he has accepted an office of which the only legitimate reward—over and above an agreed stipend—is the consciousness of having faithfully served the composer and the art which is his.

Weber: "Oberon"

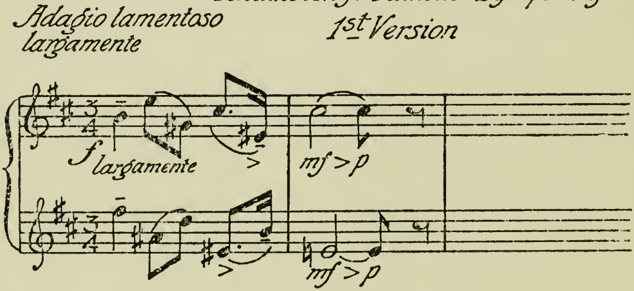


Beethoven: "Eroica" Symphony
Funeral March

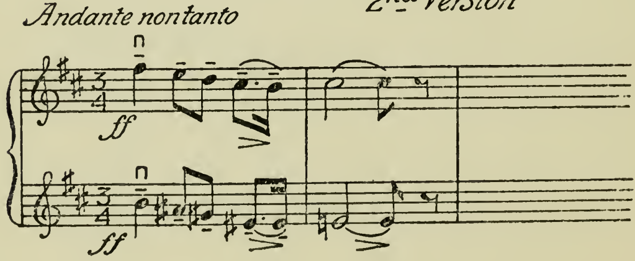


Tchaikowsky: "Pathetic" Symphony

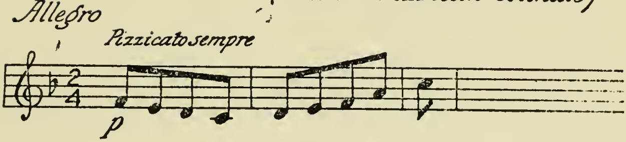
1st Version



2nd Version

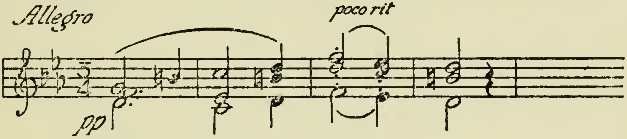


Tchaikovsky: 4th Symphony
(Scherzo: Pizzicato ostinato)

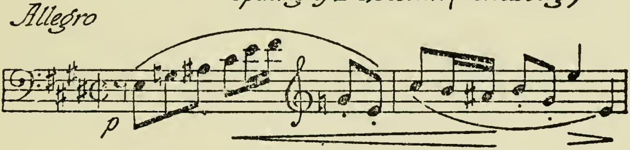


VIOLA

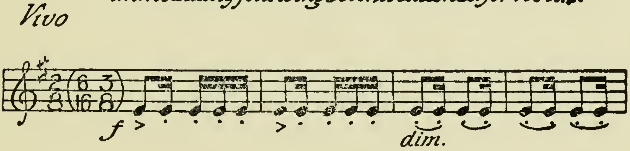
Beethoven: 5th Symphony, 3rd movement, 5th bar, following Cello passage. (Viola passage in notes with downward tails)



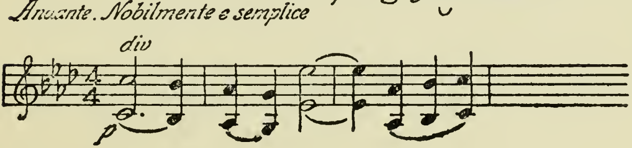
Wagner: Tannhäuser Overture,
Opening of 2nd Section (Venusberg)



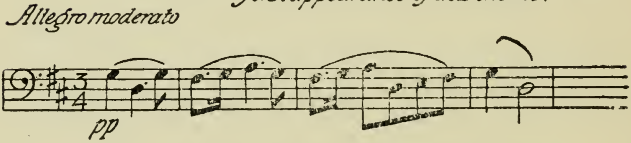
Rimsky-korsakov: "Scheherazada," 4th movement, immediately following second Cadenza for Violin.



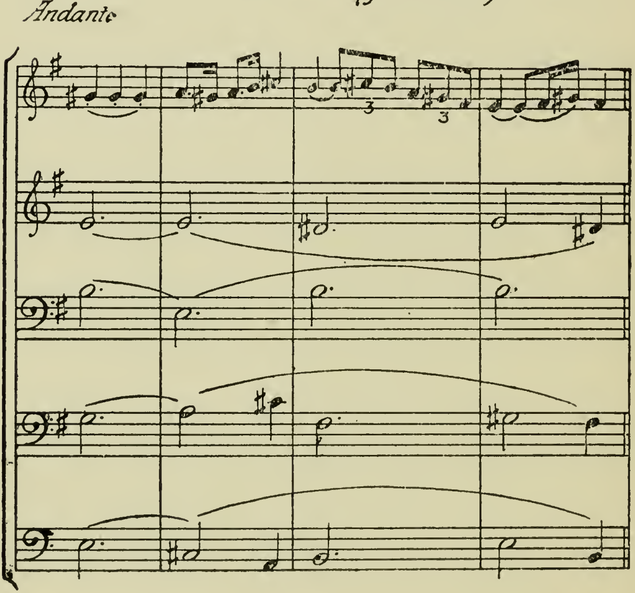
Elgar: 1st Symphony,
Opening of 1st movement.



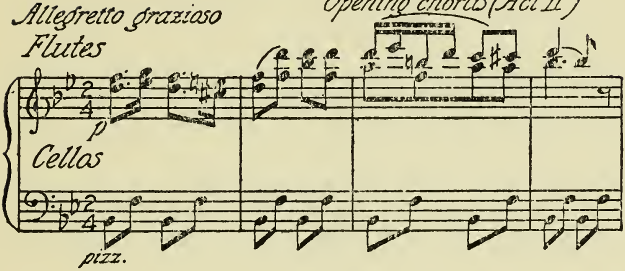
Schubert: Unfinished Symphony, 1st movement, 44th bar,
first appearance of this theme.



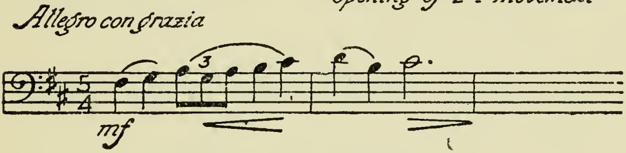
Rossini: "William Tell" Overture 17th bar.
(for 5 Cellos)



Sullivan: "The Mikado,
Opening chorus (Act II)

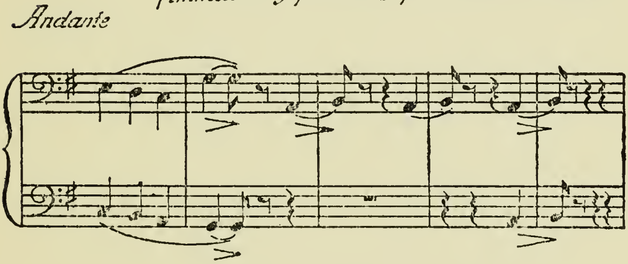


Tchaikowsky: "Pathetic" Symphony
Opening of 2nd movement

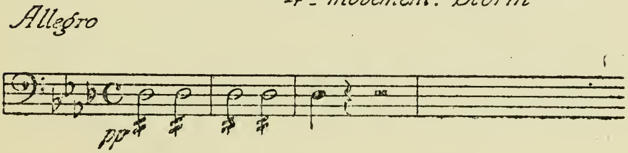


DOUBLE BASS

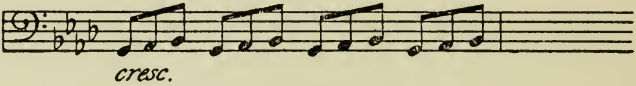
Rossini: "William Tell" Overture
(immediately preceding passage for 5 cellos.)



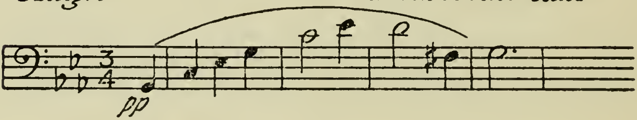
Beethoven: "Pastoral" Symphony.
4th movement: "Storm"



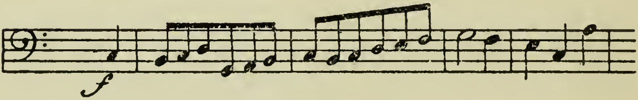
Ibid:
19th bar.



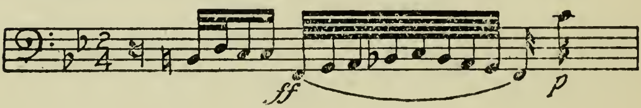
Beethoven: 5th Symphony,
Opening of 3rd movement
an octave below cellos



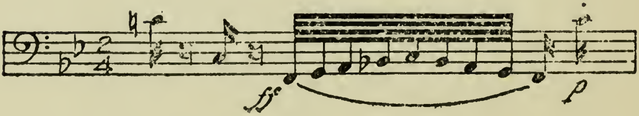
Ibid:
Opening of middle section



Beethoven: 8th Symphony.
2nd movement 23rd bar.

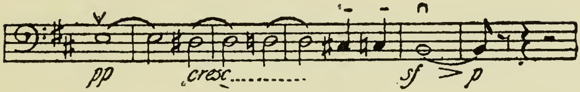


Ibid:
25th bar.



Tchaikowsky: "Pathetic" Symphony.
Opening bars.

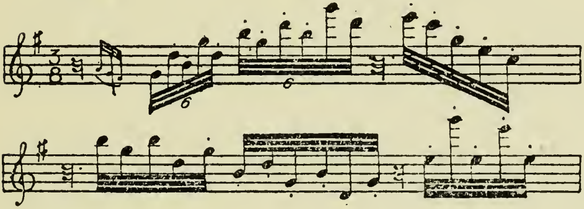
Adagio.



FLUTE

Rossini: "William Tell" Overture
(Accompanying English horn solo.)

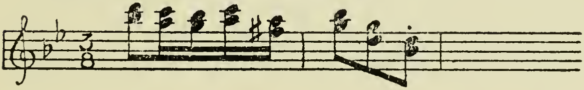
Andante



2 Flutes

Mendelssohn:
"Midsummer Night's Dream" Scherzo.

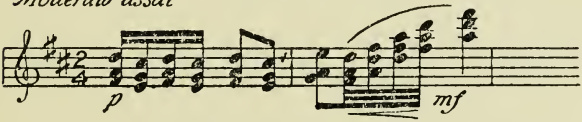
Allegro vivace



3 Flutes

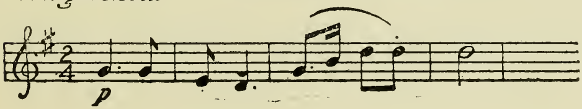
Tchaikovsky: "Nut-Cracker" Suite
"Danse des Mirlitons" 3d bar.

Moderato assai



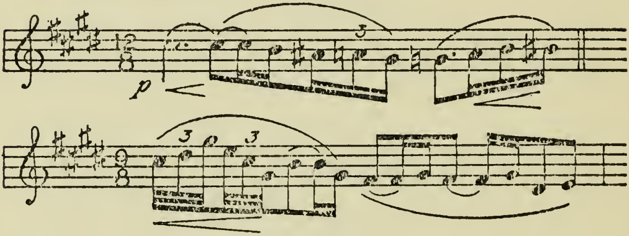
Dvořák: "New World" Symphony
(1st Movement. 2nd Subject.

Allegro Molto



Debussy: Prelude à "L'après-midi d'un Faune.
21st bar.

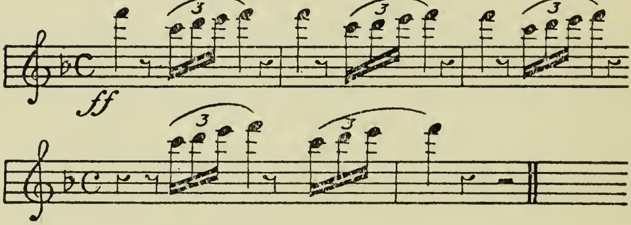
Très modéré Légèrement et expressif



PICCOLO

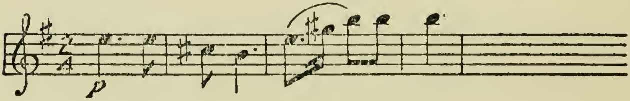
Beethoven: Egmont Overture
closing bars.

Allegro con brio.



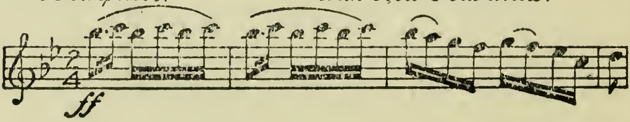
Dvorak "New World" Symphony, 1st movement 2nd subject
immediately following horn's repetition of same

Allegro molto

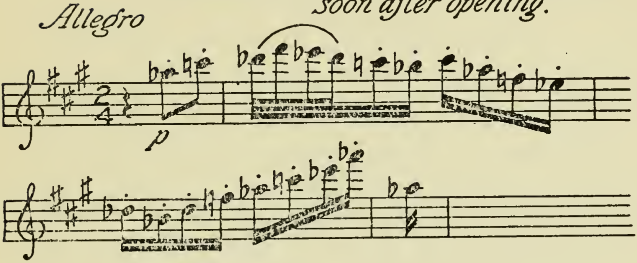


Rimsky-Korsakov: Spanish Caprice
III Alborada, Opening bars.
with Oboes & Clarionets.

Vivo e strepitoso.

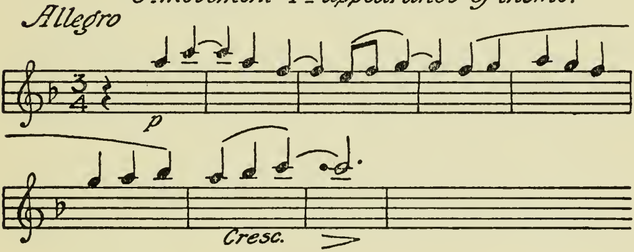


Tchaikovsky: 4th Symphony, Scherzo, soon after opening.

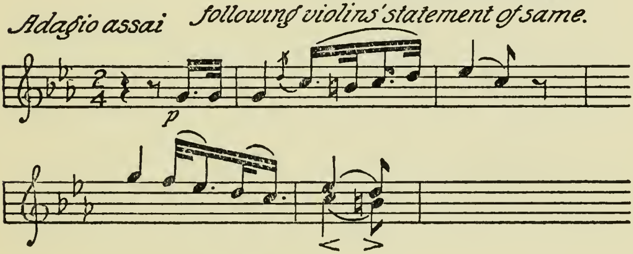


OBOE

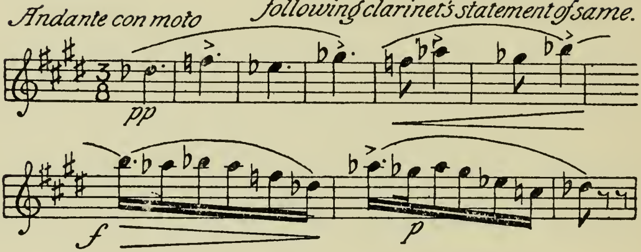
Beethoven: "Pastoral" Symphony 3d movement 1st appearance of theme.



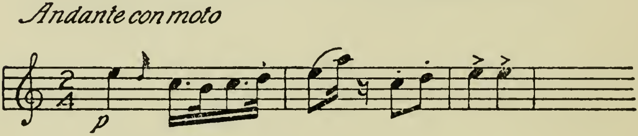
Beethoven: "Eroica" Symphony Funeral March 8th bar following violins' statement of same.



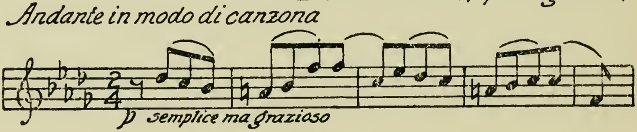
Schubert: Unfinished Symphony
2nd movement,
following clarinet's statement of same.



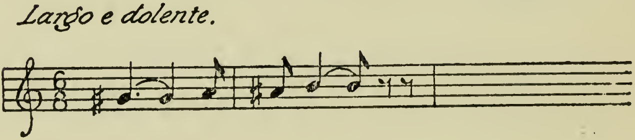
Schubert: C major Symphony
2nd movement 8th bar.



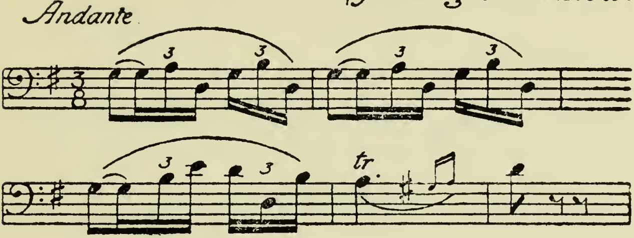
Tchaikovsky: 4th Symphony
2nd movement, opening bars.



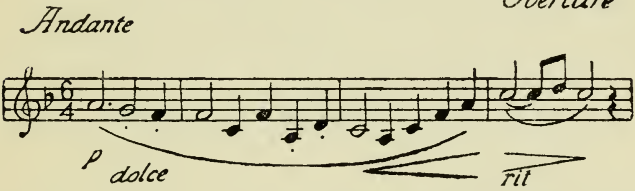
Wagner: Prelude to "Tristan & Isolde,"
2nd bar



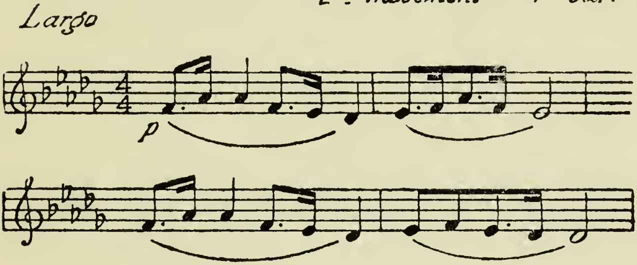
Rossini: "William Tell" Overture
(following "Storm" Scene.



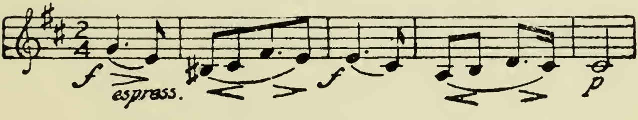
Wagner: "Flying Dutchman"
Overture



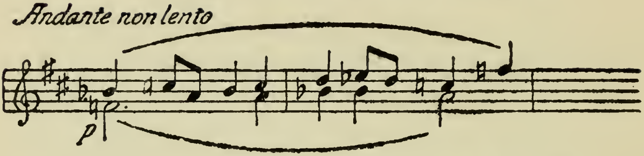
Dvořák: "New World" Symphony
2nd movement 7th bar.



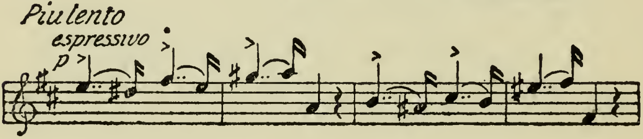
Tchaikovsky: "Nut Cracker Suite" "Danse des Mirlitons",
19th bar, following statement of opening theme (3 flutes)
Moderato assai.



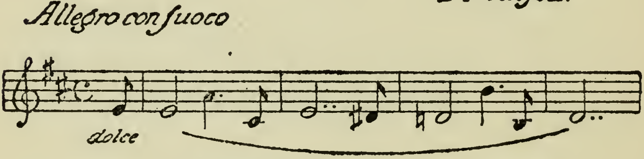
Herold: "Zampa" Overture



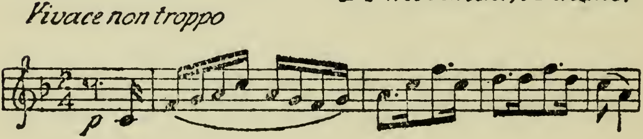
Ibid. (with strings pizzicati)



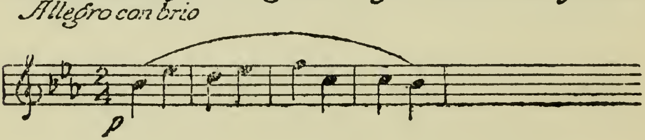
Weber: "Oberon" Overture
2nd subject.



Mendelssohn: Scotch Symphony
2nd movement, 1st theme.

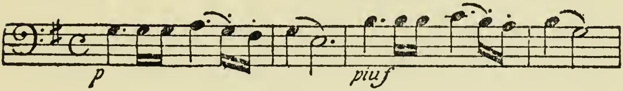


Beethoven: 5th Symphony,
1st movement, following violins' first statement of same



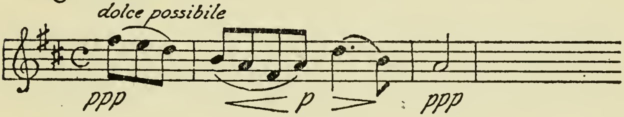
Tchaikovsky: 5th Symphony
1st movement, opening bars.

Andante.



Tchaikovsky: "Pathetic" Symphony, 1st movement,
first appearance of theme in wind instruments.

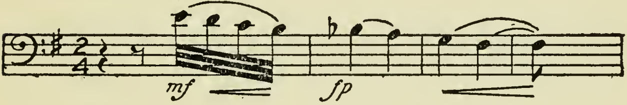
Adagio mosso



BASS CLARIONET

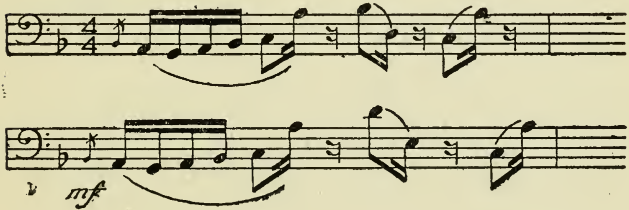
Tchaikovsky: "Nut cracker" Suite "Danse de la Fée-Dragée."
8th bar (with Celesta)

Andante non troppo.

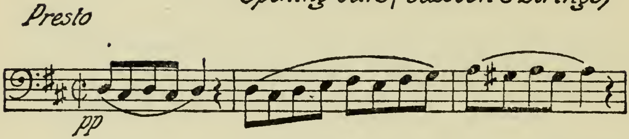


Strauss: "Don Quixote." Sancho Panza episode
following "The Knight of the rueful countenance
& preceding 1st variation.

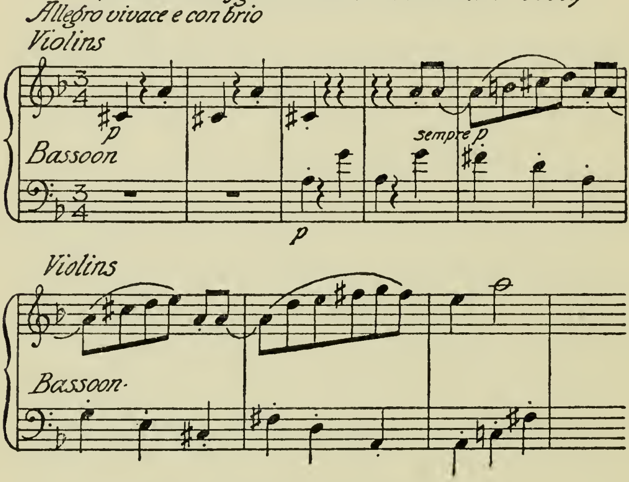
Maggiore



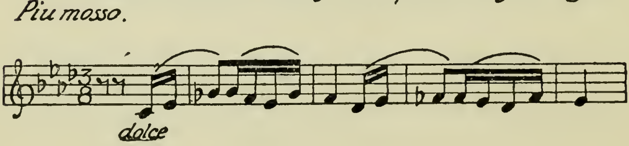
Mozart: "Figaro" Overture,
Opening bars (bassoon & strings)



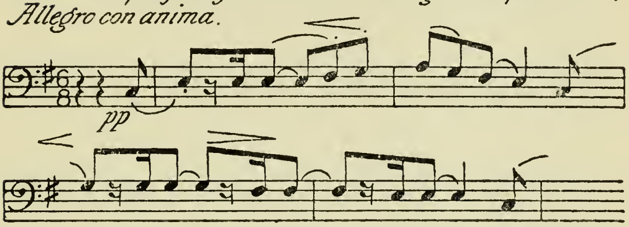
Beethoven: 8th Symphony, 1st movement, 34th bar,
(Violin melody given later to bassoon with oboe.)



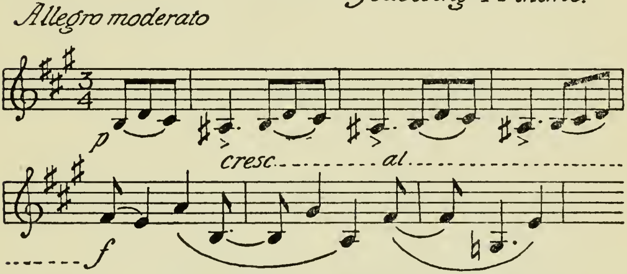
Beethoven: 5th Symphony, 2nd movement
towards close, melody accompanied by strings.



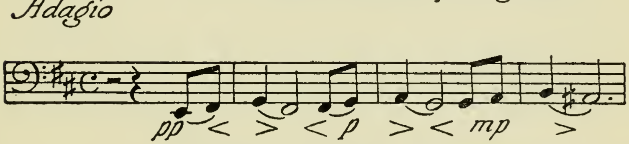
Tchaikovsky: 5th Symphony, 1st movement, theme originally introduced by bassoon & clarinet here played by bassoon with string accompaniment.



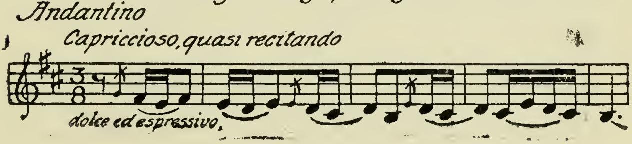
Ibid: 3rd movement, following 1st theme.


Allegro moderato
p
cresc. . . . . al . . . .
. . . . f

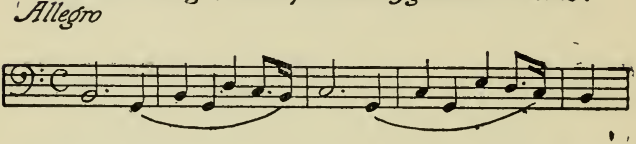
Tchaikovsky: "Pathetic" Symphony, 1st movement, opening bars.



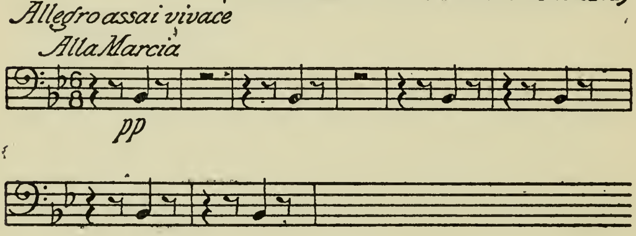
Rimsky-Korsakov "Scheherazade" 2nd movement following opening violin cadenza.



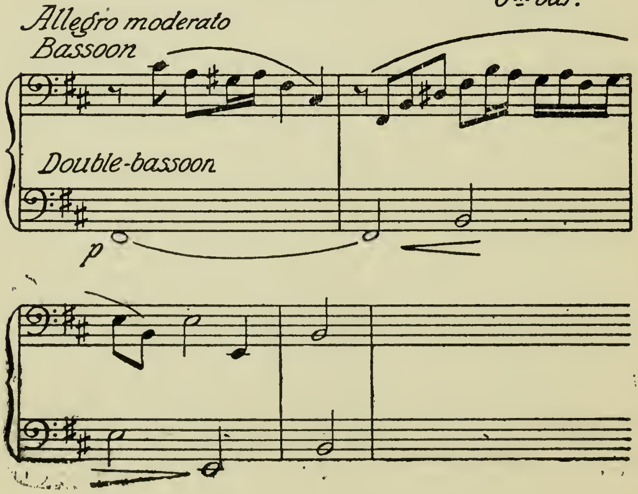
Beethoven: 5th Symphony. Last movement, soon after resumption of March. (Double-bassoon & lower strings, theme previously given to violins.



Beethoven: 9th Symphony. Finale. Opening of Alla Marcia (Double-Bassoon with bassoon & drum)

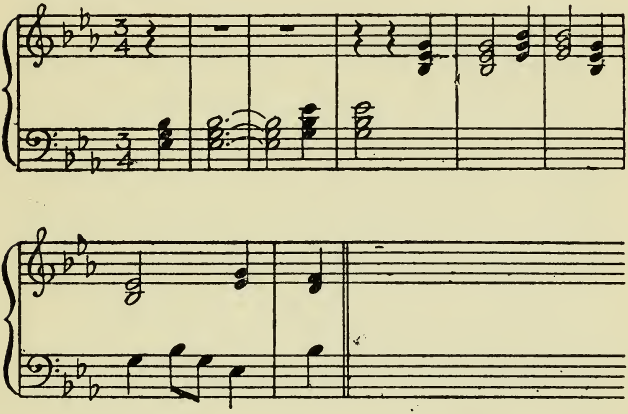


Mendelssohn: "Hebrides" Overture. 6th bar.



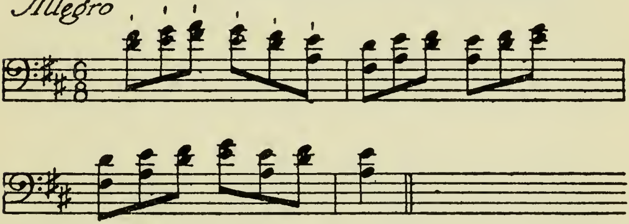
Trio. *Beethoven: "Eroica" Symphony 3rd movement. Opening bars of Trio.*

Allegro vivace.



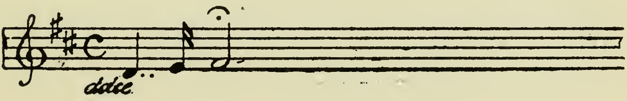
Beethoven: Violin Concerto. Finale. accompanying second theme.

Allegro

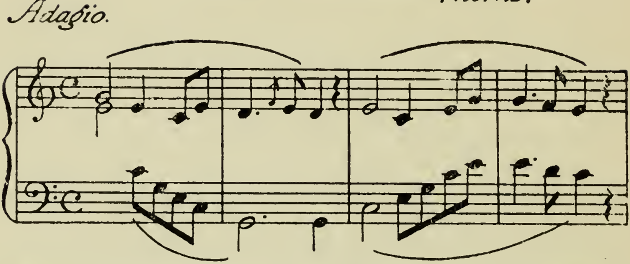


Weber: "Oberon" Overture, opening bars.

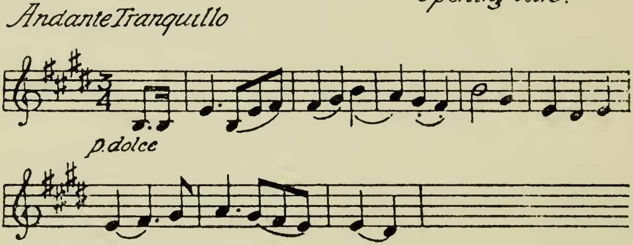
Adagio sostenuto



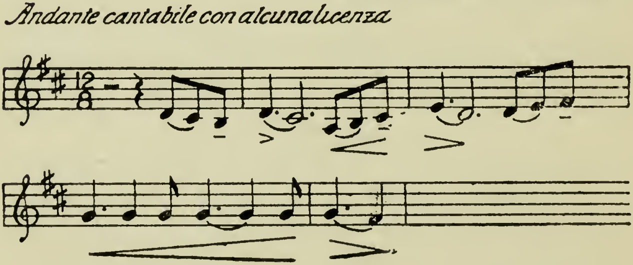
Weber: "Freischütz" Overture
4 horns.



Mendelssohn: Nocturne from "Midsummer Night's Dream"
Opening bars.

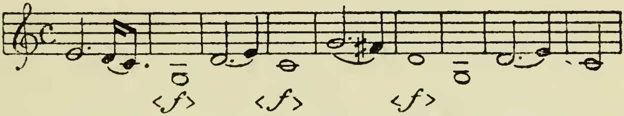


Tchaikovsky: 5th Symphony
2nd movement 1st theme.



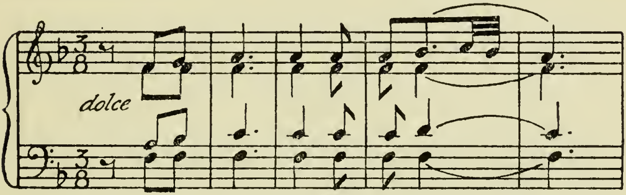
Brahms: 1st Symphony
Last movement.

Piu andante f sempre passionato.



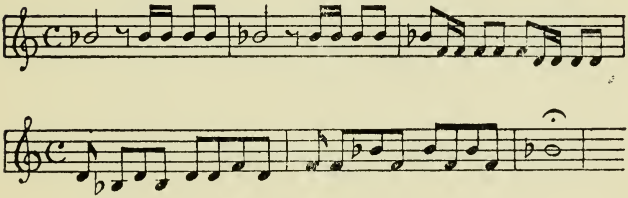
Rimsky-Korsakov: Spanish Caprice II Variazioni,
Opening bars.

Andante con moto



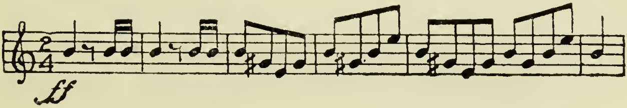
TRUMPET

Beethoven "Leonora"
Overture Nº3.



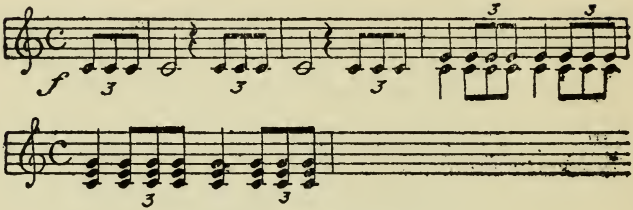
Rossini: "William Tell"
Overture.

Allegro vivace



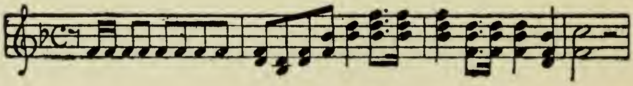
Mendelssohn: Wedding March.

Allegro vivace.



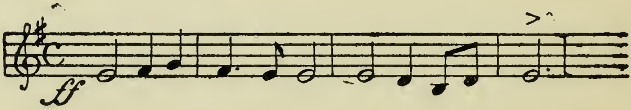
Wagner: Tannhaüser
Procession into Hall of Song (Act II)

Allegro.



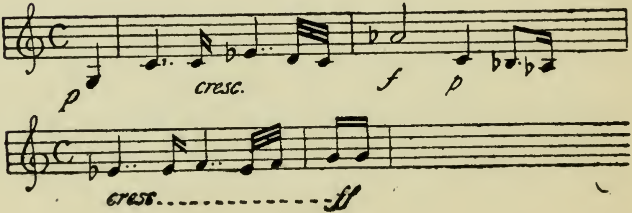
Dvořák: "New World" Symphony
1st subject, last movement (with horns)

Allegro con fuoco.

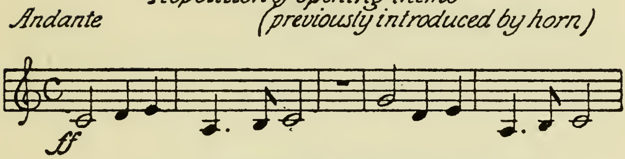


BASS TRUMPET

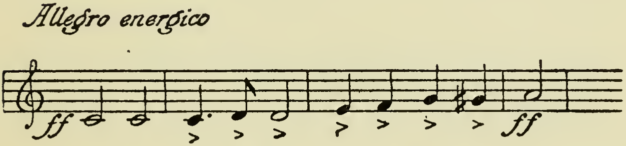
Wagner: Funeral March from "Götterdämmerung"
First appearance of theme (with horns)



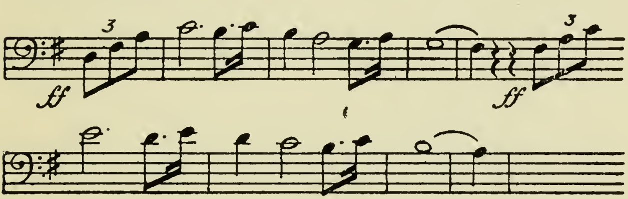
Schubert: Symphony in C. 1st movement
Repetition of opening theme
(previously introduced by horn)



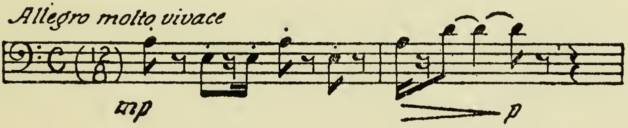
Wagner: "Rienzi" Overture.



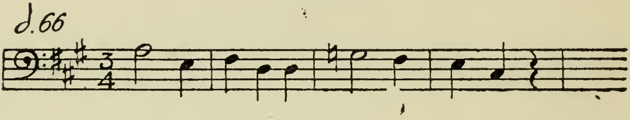
Wagner: "Lohengrin"
Nuptial March (Act III)



Tchaikowsky: "Pathetic" Symphony, 3rd movement
Repetition of 1st subject, (previously introduced by oboe)



Rimsky-Korsakov: Spanish Caprice V Fandango asturiano.
Opening bars (with Tuba)



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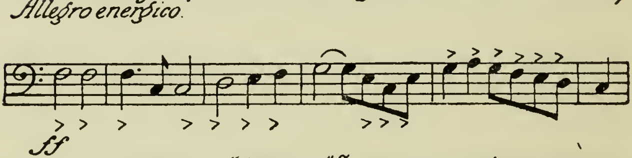
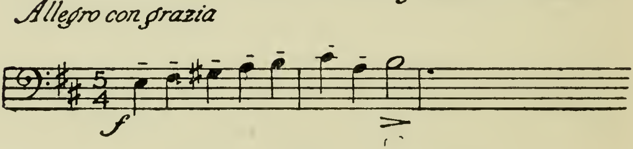
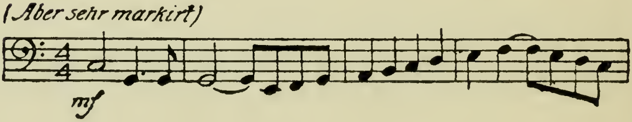
Wagner: "Rienzi" Overture
Bass of response to theme given above (Trombone)



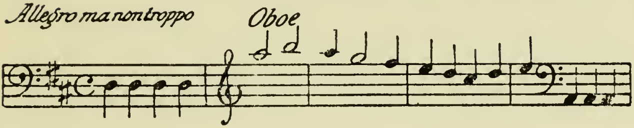
Tchaikowsky: "Pathetic" Symphony, 2nd movement.
4th statement of theme in brass.



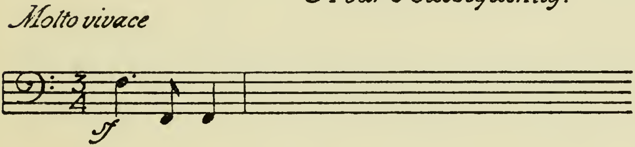
Wagner: "Meistersinger" Overture
(following statement of same by Trumpet & Trombone



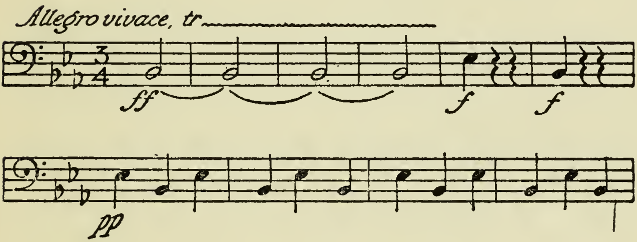
Beethoven: Violin Concerto
1st movement, 1st & 5th bars



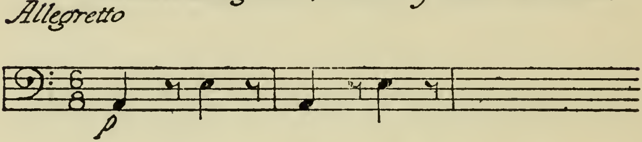
Beethoven: 9th Symphony, 2nd movement,
5th bar & subsequently.



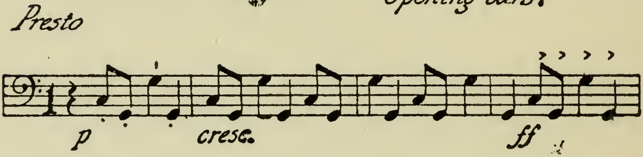
Beethoven: "Eroica" Symphony.
3rd movement, Coda.



Rimsky-Korsakov: Spanish Caprice IV.
Scena e canto gitano, at close of Violin cadenza.

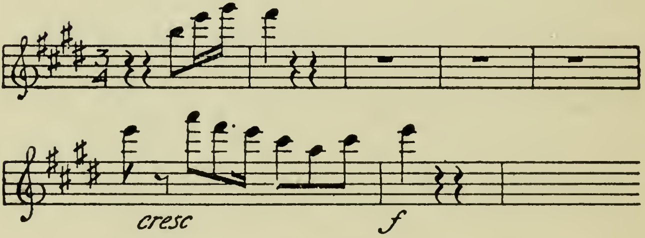


Elgar: "Enigma" Variations VIII (Troyte)
Opening bars.

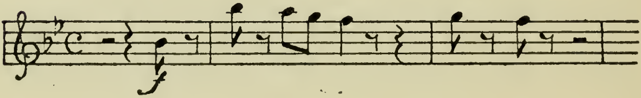


GLOCKENSPIEL

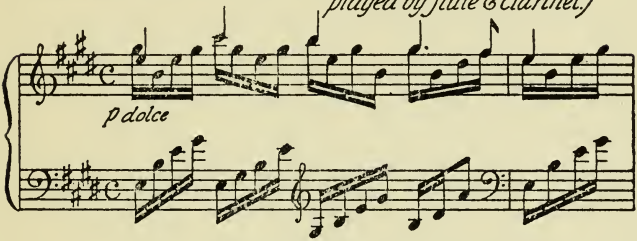
Wagner: Siegfried. Waldweben.



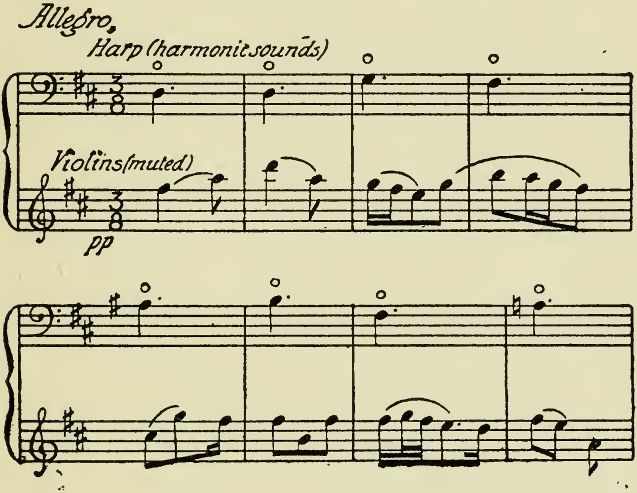
Tchaikovsky: "Nutcracker" Suite "Danse chinoise."
with 3rd statement of theme by flute.

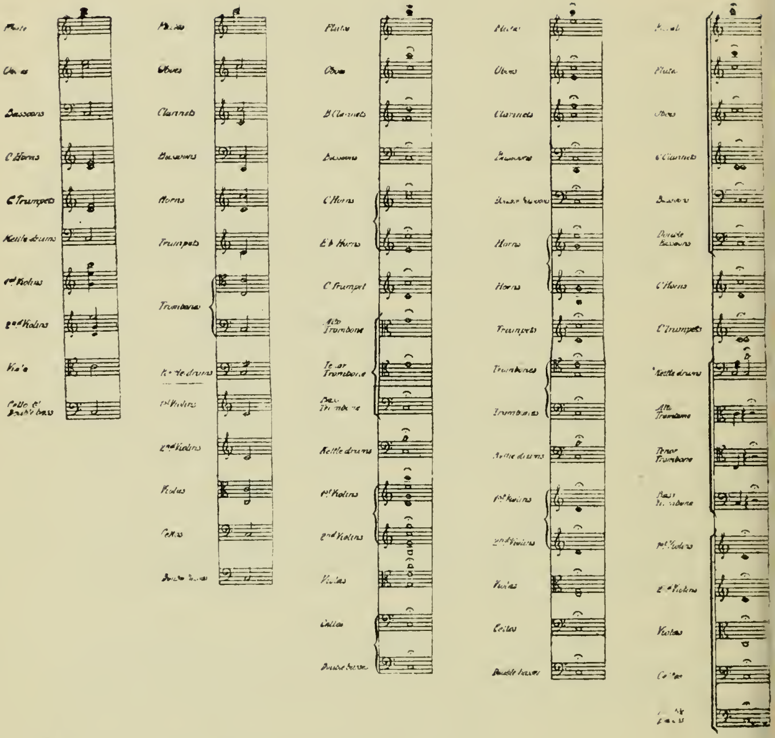


Wagner: Die Walküre. "Feuerzauber"
(The notes in treble with up-turned tails belong to the melody played by flute & clarinet.)

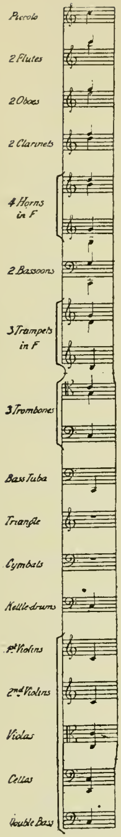


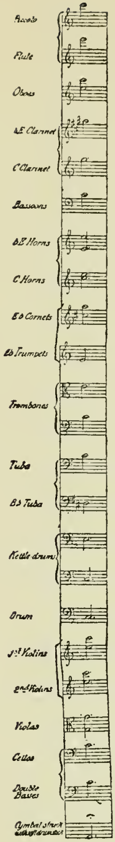
Berlioz: Valse des Sylphes

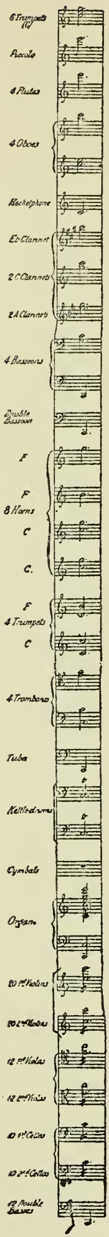


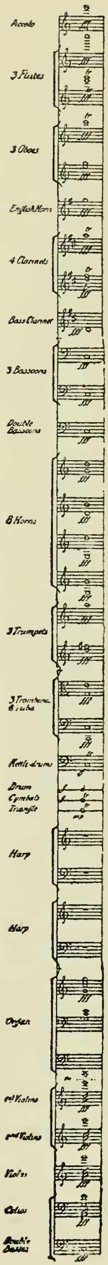


1. Mozart: "Jupiter" Symphony, No. 5 Final chord.
2. Schubert: Symphony in C, Final chord.
3. Mendelssohn: "Ruy Blas" Overture, Final chord.
4. Brahms: C minor Symphony, Final chord.
5. Beethoven: 5th Symphony, Final chord.









6. Wagner: Meistersinger Overture, Final chord.
7. Berlioz: Fantastic Symphony, Final chord.
8. Strauss: Festival Prelude, Final chord.
9. Skryabin: Poem of Ecstasy, Final chord.

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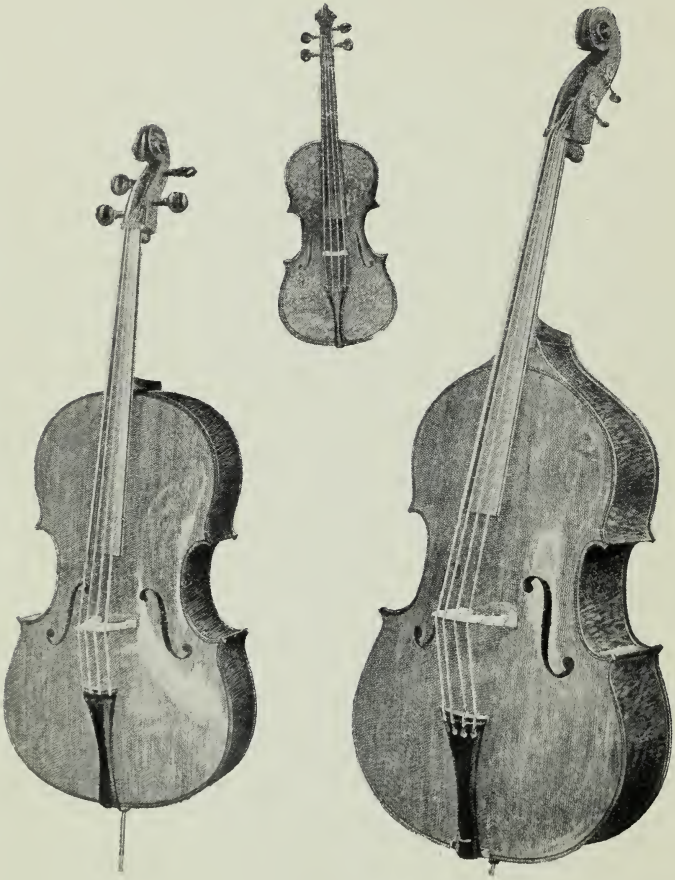
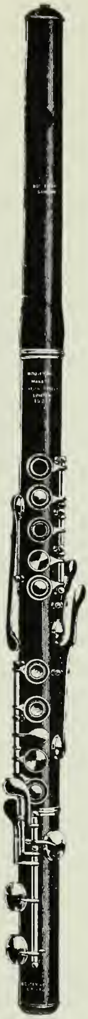
APPENDIX III.

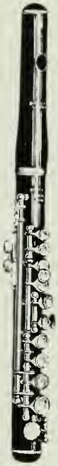
ILLUSTRATIONS OF MUSICAL INSTRUMENTS.



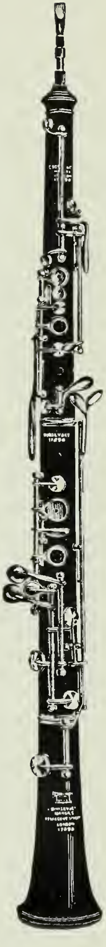
VIOLONCELLO. VIOLIN. DOUBLE-BASS.



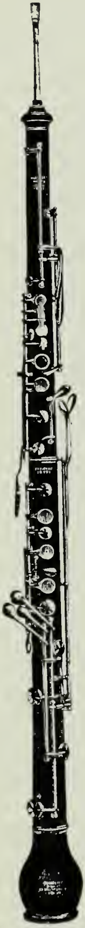
FLUTE.



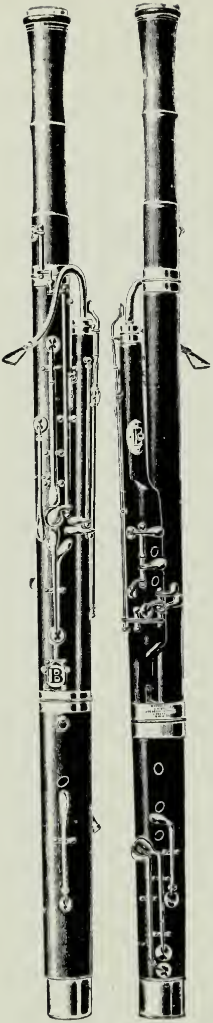
PICCOLO.



OBOE.

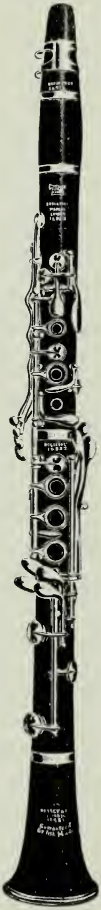


ENGLISH HORN.

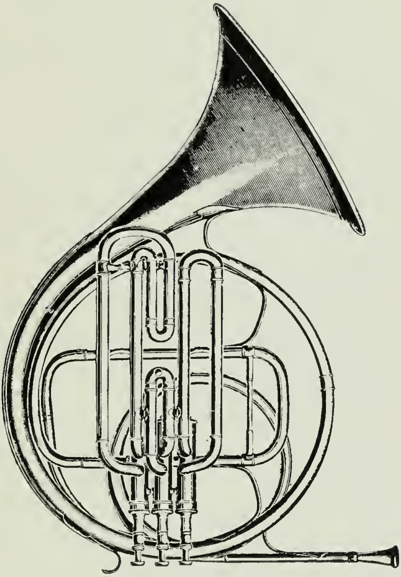


Back View. Front View.

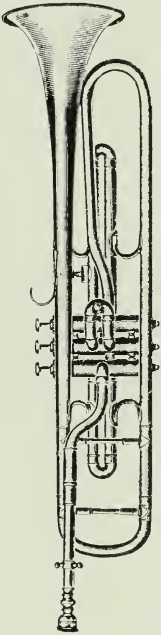
BASSOON.



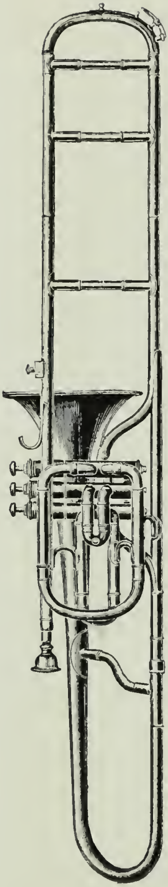
CLARIONET.



FRENCH HORN.



TRUMPET.



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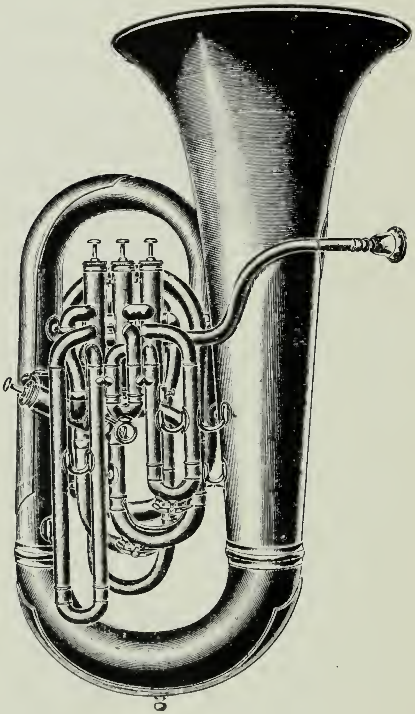

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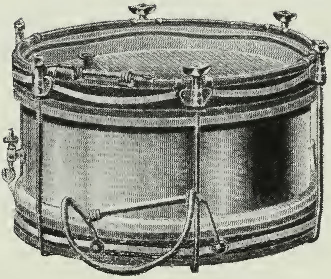

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